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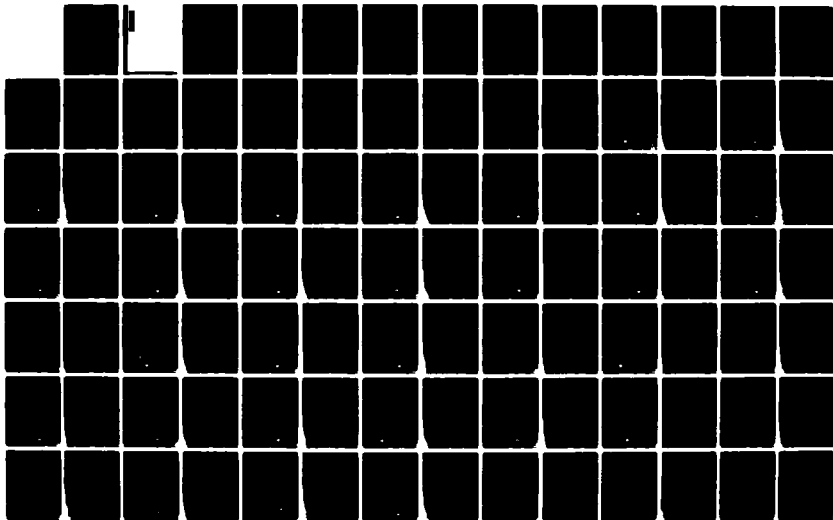
MULTIPLE-PURPOSE PROJECT OSAGE RIVER BASIN HUNDRED AND  
TEN MILE CREEK KAN. (U) CORPS OF ENGINEERS KANSAS CITY  
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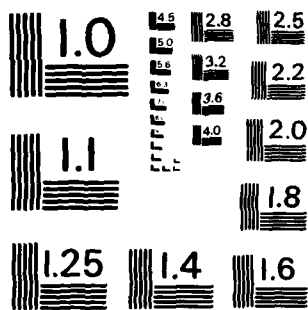
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The purpose of this report is to present a complete record of the geology and foundation conditions encountered during construction of Pomona Dam. The report focuses primarily on the foundations of the outlet works, right abutment, and spillway area where the bulk of rock foundations are involved.		

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OPERATION AND MAINTENANCE MANUAL

POMONA LAKE

HUNDRED AND TEN MILE CREEK, KANSAS  
OSAGE RIVER BASIN

APPENDIX VII

CONSTRUCTION FOUNDATION REPORT

*Supersedes  
Previous report*

1977  
(Revised October 1983)

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DEPARTMENT OF THE ARMY  
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OPERATION AND MAINTENANCE MANUAL

POMONA LAKE  
HUNDRED AND TEN MILE CREEK, KANSAS  
OSAGE RIVER BASIN

APPENDIX VII

CONSTRUCTION FOUNDATION REPORT

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DEPARTMENT OF THE ARMY  
Kansas City District, Corps of Engineers  
700 Federal Building  
Kansas City, Missouri 64106

POMONA LAKE  
HUNDRED AND TEN MILE CREEK, KANSAS  
OSAGE RIVER BASIN

FOUNDATION REPORT

CHAPTER 1

INTRODUCTION

1-01. Location and Description.

a. Pomona Lake is located at mile 7.0 on One Hundred and Ten Mile Creek, a tributary of the Marais des Cygnes River in Osage County, Kansas (see plate No. 1). The project is designed for multipurpose use in flood control and water conservation. The flood control (full) pool at elevation 1003 covers 8,600 surface acres and stores 176,500 acre-feet of water. The conservation pool, at elevation 974 covers 4,000 surface acres and stores 70,000 acre-feet of water. The dam consists of a zoned earthfill embankment, about 7,750 feet long, 111 feet high, with a maximum base width of 900 feet (see plate No. 21). The top of dam elevation is 1031. The outlet works is located in the right abutment approximately at flood plain level (see plate No. 21) and consists of an approach channel, control tower, a 13.5 foot (ID) single horseshoe conduit, transition section, stilling basin and outlet channel. Invert elevations range from 925 at the intake tower to 914 in the stilling basin. Outlet works capacity is 9,200 c.f.s. The uncontrolled spillway is located in a natural saddle about 1,760 feet west of the right abutment (see plate No. 21) and consists of a 200 foot wide by 1,500 foot long channel with an anchored concrete sill.

1-02. Construction Authority. Pomona Lake was constructed under authorization of the Flood Control Act of 1954, approved 3 September 1954, (Public Law 780, Eighty-Third Congress, Second Session).

1-03. Purpose and Scope. The purpose of this report is to present a complete record of the geology and foundation conditions, excavation procedures and equipment for future use. This report will focus primarily on foundations for the outlet works, right abutment, and spillway area where the bulk of rock foundations are involved. Stage I Construction was awarded to List and Clark Construction Company, Kansas City, Missouri, by Contract Number DA-23-028-CIVENG-59-551. Work on this contract started in July 1959 and consisted of excavating and making initial diversion of the stream, placing a portion of the embankment between the right abutment and the diversion channel, excavating and constructing the outlet works, and the bulk of work in constructing the spillway and construction of some of the access and service roads. The Resident Engineer was Mr. Fredrick Blanks.

Completion of Embankment Contract was awarded to Cook Construction Company, Jackson, Mississippi, Contract Number DA-23-028-CIVENG-61-250. Work on this contract started in January 1961 and consisted primarily of completing the embankment and making closure and diversion. The Resident Engineer was Mr. Ralph Dennis. The Project Geologist for both Stages was Mr. Lynn C. Myers.

## CHAPTER 2

### FOUNDATION INVESTIGATIONS

#### 2-01. Investigations Prior to Construction.

a. A total of 326 test borings were completed prior to construction, of which 152 were drive holes, 20 undisturbed sample holes, 71 bedrock core holes, and 33 auger holes. In addition, fifty 30-inch or 36-inch machine auger holes were drilled as test pits. Most of the drive holes were 3-inch diameter and the balance were 6-inch. The bedrock core borings were of 2-1/8-inch and 6-inch diameter. A total of 4,420 lineal feet of overburden drilling and 4,053 lineal feet of bedrock coring was completed prior to construction (see plate No. 31).

b. Pressure Testing. Eleven core holes were pressure tested before construction. Two of these were located on the left abutment, two in the flood plain, four in the outlet works area, and three in the spillway area. Expansion packers set at 5-foot intervals were used in conducting flow tests and pressure duration tests at each location immediately following completion of drilling. Tests indicate a relatively tight foundation. Water and water pressure losses were practically negligible except in the upper few feet of the borings, in the primary zone of weathering. Results of pressure tests during grouting are shown on plates Nos. 36 thru 41.

2-02. Investigations During Construction. Sixty-three drive holes totaling 762 lineal feet and 30 core holes totaling 531 lineal feet were completed by Government drill crews. Sixty-three hand auger holes were completed by project personnel in developing the borrow areas.

#### 2-03. Geology and Physiography.

a. General. Pomona Lake lies within the physiographic region known as the Osage Plains Section of the Central Lowland Province. This section is characterized by a series of plains separated by eastward facing escarpments, formed by differential erosion of harder and softer, upper Pennsylvanian limestone and shale strata, which dip gently westward. Hundred and Ten Mile Creek rises in the northwestern corner of Osage County, a few miles north of the town of Burlingame. It is a moderately incised, meandering stream with a relatively low gradient flowing within a mature valley. Valley widths average about 3,000 feet along Hundred and Ten Mile Creek with slightly greater widths along Dragoon Creek, a major tributary.

b. Topography. Major topographic forms in the dam and reservoir area are the Hundred and Ten Mile Creek flood plain and bordering steeper slopes on the right and more gentle slopes on the left abutment. At the centerline of the dam, the flood plain is approximately 3,500 feet wide. Hundred and Ten Mile Creek flowed near the right valley wall at the elevation 920 feet, m.s.l., with flood plain elevations ranging from 935 to 950 feet, m.s.l. The right abutment rises steeply at the axis to an elevation of 1066 in 800 feet, while the left abutment rises gently to elevation 1085 in 4,600 feet from the left edge of the flood plain.

Along the left abutment slope, two levels of terrace remnants form rather pronounced benches; one at elevation 945± and another at elevation 990±. These terraces reflect the positions of two major limestone ledges underlying them. At the damsite, ancient stream action has scoured deeply at a point in the vicinity of the present stream channel producing, in effect, a "buried channel."

c. Overburden. Overburden soils are primarily alluvial in origin, with older alluvial terrace remnants covering a major portion of the valley slopes. Residual soils occur as thin layers immediately above bedrock over a considerable area and also comprise a major portion of the overburden in the upper abutment slopes in the vicinity of the dam. Soils vary from fat to lean clays with fat clays predominating in the valley slopes and lean clays in the flood plain. The older alluvial terrace soils contain varying amounts of chert gravel which locally range as high as 60 percent. The recent alluvium of the buried channel contains irregular lenses and layers of silty, clayey gravel below a depth of 22 feet and may persist over areas of considerable extent. The maximum amount of overburden exists in a buried channel that is located along and intersecting the upstream toe of the embankment. This ancient channel was exposed in the diversion at station 41+00, range 4+25 U.S. and indications are that it extends along a NE-SW line to station 30+00, range 0+00. Elsewhere, the overburden is generally 3 to 15 feet thick. The Plattsmouth limestone exhibits a subdued outcrop on the left abutment while more prominent outcrops of Kereford limestone Clay Creek limestone, and Spring Branch limestone occur on the right abutment. Consequently, no appreciable amount of excavation was required on the abutments to find competent foundation. The right abutment was brought to preliminary grade after clearing and grubbing operations by the Stage I Contractor.

d. A cutoff trench was excavated from station 25+00 on the right abutment to station 85+00 on the left abutment according to plans and specifications (see photo No. 31), except in the vicinity of station 26+50 to station 27+00 where the necessity for such a trench was eliminated by the removal of materials from slides which occurred along the excavated slope of the Heumader shale. The plane of weakness causing the slides was in the transition zone between the residual clay and the shale. This shale weathers to a fat clay and it is, therefore, extremely difficult to hold on slopes steeper than 1V on 2.5H. Another such slide occurred downstream of the stilling basin. This slide necessitated removal of some 18,000 cubic yards of overburden and the placement of rockfill.

2-04. Bedrock Stratigraphy. The bedrock strata of this area are classified as upper Pennsylvanian system; the Virgilian series, Shawnee group. The uppermost formation is the Lecompton limestone with the members named in descending order: Avoca limestone, King Hill shale, Beil limestone, Queen Hill shale, Big Springs limestone, Doniphan shale and the Spring Branch limestone. The spillway is founded on the Spring Branch limestone member. For convenience during excavation, it was divided into three zones: "A" zone - 7 feet of limestone, "B" zone - 6 feet of shale, and "C" zone - 6 feet of limestone. The middle formation is the Kanwaka shale with the members named in descending order: Stull shale, Clay Creek limestone and

Jackson Park shale. The abutment of the service bridge is founded on top of the Clay Creek limestone member. The lowest formation in the work area is the Oread limestone. Its members in descending order are as follows: Kereford limestone, Heumader shale, Plattsmouth limestone, Heebner shale, Leavenworth limestone, Snyderville shale and Toronto limestone which is present in the left abutment only. The bulk of foundation excavation was in the upper three members of this formation, and the Plattsmouth serves as foundation for the outlet works. The lower four members are below any excavation (see plate No. 32).

2-05. Bedrock Structure. The general bedrock structure of the area can be described as a gentle homocline dipping slightly NNW approximately one foot vertical for every 110 feet horizontal with minor variations in local areas of the foundation of the outlet works. There the strata dip downstream SSE. From range 2+25 U.S. to 0+50 D.S. The dip is one foot in 55 feet. From range 0+50 D.S. to 1+00 D.S. The dip is one foot in 8 feet. From range 1+00 D.S. to 1+60 D.S., the strata rises one foot in 30 feet. From range 1+60 D.S. to 4+99 D.S. the dip is one foot in 170 feet. Bedrock in the spillway is essentially horizontal, dipping due east approximately 1.5 feet in 200 feet.

2-06. Weathering.

a. Chemical weathering of the strata was noted in the foundations of monoliths 5 thru 10 of the conduit. The lower Plattsmouth limestone was stained red and some solution channels were noted. The upper 0.5 foot of the limestone in this area was somewhat leached. Shale partings were weathered to clay or were completely removed.

b. Mechanical weathering was noted in the limestone foundation of monoliths 5 thru 9 of the conduit. The left (or riverward) half of the foundation was generally 0.5 feet to 1.0 foot lower than the right half of the foundation, with some small potholes 1.5 feet lower than the general foundation surface.

2-07. Strength of Rock. Core samples from 17 drill holes have been tested for strength in vertical compression, dry weight, moisture content, and wet-dry tests. Results are included in table II. With the exception of the Heebner shale member, all shale samples broken down completely during the first cycle of wetting and drying. The Heebner shale ranged from 100 percent breakdown in one cycle to no change in 20 cycles. The upper Heebner was the more vulnerable to this type of test.

## CHAPTER 3

### FOUNDATION CONDITIONS AND TREATMENT

#### 3-01. Excavation.

a. Common Excavation. Overburden excavation of the diversion channel began in July 1959. After stripping, all satisfactory material was placed in the impervious zone of the embankment. This was followed by overburden excavation of the outlet works and the spillway. The excavated materials were placed in either the impervious, berm, or in waste areas as determined by their character during excavation. The equipment used for overburden excavation was a dragline and Euclid belly dump trucks.

b. Rock Excavation. Rock, from required excavation, was utilized in the embankment. Amonium nitrate and 60 percent dynamite were used. No blasting records were kept. The powder factor averaged 0.75 pounds of explosives per cubic yard of rock. Rock from required excavation in the diversion channel and outlet works was used as class I rockfill, class II rockfill and bedding, (see photo No. 34). Rock excavated from the spillway was used as limestone and shale fill. Line drilling and shot hole drilling was accomplished with air-trac type equipment. The rock excavation lines were generally within the prescribed limits, (see photo No. 19). One notable exception occurred where the right training wall ties into the Plattsmouth limestone approach channel. This portion was somewhat overshot and 19 cubic yards of fill concrete were used by the Stage I Contractor to backfill the overbreak. Another overbreak occurred in the upstream key trench of the spillway where 15 cubic yards of structural concrete was used. Excavation of this trench and the downstream trench was difficult because of the interior rock slopes indicated in the plans. After trying several schemes involving variations of shot hole drilling and firing delays, the Contractor line drilled (on an angle) this slope. The resulting excavation line was excellent and this method was used for the remaining interior slopes, (see photos Nos. 20 thru 30, and plate No. 32). Rock excavation was accomplished with power shovels, draglines, Turnarockers, and Euclids.

3-02. Anchor Bars. Anchor bars were installed in the stilling basin and in the spillway. Holes were drilled with 6-inch diameter tricone roller bits using air to remove drill cuttings. The drill rig was mounted on a D-8 caterpillar dozer that also carried a compressor and dust exhausting system. All holes in the horizontal section of the spillway were drilled prior to excavating the sill to final grade. This allowed the drilling to be done from a level surface. The holes were then filled with sand and remained in that condition until the excavation was later brought to final grade. The holes were overdrilled 0.5 foot and then cleaned by use of air-water jetting. The holes were then pumped and swabbed just prior to placing the anchor bars. Drilling of the anchor bar holes on the 1V on 1.5H side slopes of the spillway was done by Stage I grouting subcontractor. This drilling was done by laying track up the slope along the line of holes and using a drill rig mounted on a self-leveling platform (see photos Nos. 29, 30, 32 and 33). Anchor bar holes that penetrated more than 3 feet into the Stull shale were "belled" at



the bottom according to specifications. This was done by using a special bit designed to ride on the bottom of the hole and, by rotating and applying pressure, the cutting edges were forced out and the required dimensions obtained. The excavation was later brought to final grade, the sand was jetted out and the holes pumped and swabbed. Grout was then placed in the hole, rodded, and the anchor bar, adjusted to proper elevation, was then spaced and suspended in the grout.

3-03. Foundation Preparation. The preparation of rock foundations was accomplished in two phases. Preliminary preparation consisted of a close visual examination, aided by air-water jets, and sounding the foundation for drummy rock. A rock drill was also employed to check for soft clay seams, to a depth of 4 feet below the excavation line. Any objectionable material was hand excavated and final foundation cleanup was done immediately prior to placing concrete. This was a final wash with air and water. The water was pumped or sponged as necessary and grout and concrete placed. All rock foundations were in limestone except for a 5-foot section of Doniphan shale at the top of the 1V on 1.5H side slopes in the spillway and the service bridge pier foundation in the Heumader shale. On the shale foundation, brooming and air jets were used to prepare the foundation. Foundation surfaces where soil fill was to be placed received the same foundation cleanup as those surfaces which received concrete except that the final wash was omitted. The soil foundation areas were prepared to receive fill by scarifying and rolling according to the plans and specifications.

3-04. Character of Foundations.

a. Outlet Works. The rock foundations of both the outlet works and the spillway were excavated along essentially horizontal bedding planes and are considered to be excellent. Although the foundation of the outlet works is jointed, the joints are tight and unstained except in the riverward half of monoliths 5 thru 9, as indicated previously (see photos Nos. 1 thru 14 and plate No. 35). To further substantiate the degree of competency of the foundation, 22 rock drill holes were drilled to check the subsurface for weak zones. Where soft zones or solution channels were found, the material was removed prior to final preparation. A shale bed, in the lower Plattsmouth limestone in the outlet works foundation between monoliths 5 and 12, was excavated because of its soft condition. At monolith 12 the shale's competence improved and the foundation excavation grade was raised 1.5 feet to the top of the shale.

b. Spillway. The foundation of the spillway slab was not mapped. It was in unweathered Spring Branch limestone, "C" zone, and was in excellent condition. The least competent foundations here underlined the top slabs of the sill on both slopes. These portions rest on comparatively weak Doniphan shale. However, very little support is needed as no appreciable load is carried. The abutment pier of the service bridge was founded on top of the Clay Creek limestone. The usual prominent jointing of this member was in evidence but the foundation appeared quite competent, as did the service bridge pier foundation which was in firm and unweathered Heumader shale (see photos Nos. 20 thru 28).

3-05. Ground Water. Control of ground water entering the foundations was not difficult but several extended wet periods proved troublesome because of surface runoff and activation of wet weather springs. Considerable pumping was required to keep the various areas dewatered. The wet periods proved especially bothersome during excavation and backfill of the 5-foot deep cutoff trench in an area near the toe of the left abutment. In this area water migrated along the top of bedrock through the valley alluvium and into the cutoff trench. The water was controlled by using centrifugal pumps and, after removal of objectionable material, normal backfilling and compaction was accomplished.

3-06. Curtain Grouting.

a. Stage I grout operations began in December 1959 and were completed in December 1960 (see plate No. 38). Grouting, using the stage grouting method, was started at Sta. 31+00, Range 0+60 U.S. and progressed to Sta. 28+60, Range 0+60, Range 0+60 U.S. Because of haul road traffic and outlet works excavation, grouting operations were then moved to the right abutment. Grouting operations began there at Sta. 26+30, Range 0+60 U.S. and progressed up slope to Sta. 24+67, Range 0+05 U.S. (see plates Nos. 40 and 41). After completing this section of the grout curtain the operations were moved to Sta. 27+55, Range 0+60 U.S. and progressed up slope to tie into the grout curtain at Sta. 26+30, Range 0+60 U.S. (see plate No. 39). The curtain was then completed between Sta. 28+60, Range 0+60 U.S. and Sta. 27+84.5, Range 0+60 U.S., except for five conduit grout holes which were completed under Modification No. 15 in July 1961. The grouting subcontractor was Air-Made Well Company, Edwardsville, Kansas (now known as the Judy Drilling Co.). The subcontractor laid railroad track on the right abutment, on the outlet works slopes and drilled grout holes with the drill mounted on the rails. This method simplified the operation of relocating over the drill holes as the succeeding zones were drilled (see photo No. 37). Excluding the five conduit holes, the Stage I Contract grouting subcontractor drilled a total of 7,212 lineal feet of grout hole, made 122 grout hole connections, and used a total of 2,386 cubic feet of cement. One thousand nine hundred and thirty-seven cubic feet of cement were injected and 354 cubic feet were used for backfill of grout holes. Under Modification No. 15 for the conduit grouting, 143 lineal feet of grout holes were drilled, four connections were made and 17 cubic feet of cement were used.

b. Embankment grouting began in June 1961 and was completed in August 1961. This contract covered the following areas: from Sta. 63+80, Range 0+60 U.S. to Sta. 67+50, Range 0+60 U.S.; and the diversion channel from Sta. 40+03, Range 0+60 U.S. to Sta. 40+98, Range 0+60 U.S. (see plates Nos. 36 and 37). Stage grouting techniques were used. The grouting subcontractor was Layne-Western Company, Kansas City, Missouri. The subcontractor drilled 1,042 lineal feet of grout hole, made 23 connections, injected 31 cubic feet of cement and used a total of 78 cubic feet of cement. A summary of grout "takes" is shown on table I.

3-07. Closure. Overburden in the diversion channel was excavated with scrapers when dry. Wet muck and organic clays were excavated with a dragline. The sides were sloped 1V on 2.5H. The excavation was continued down into Plattsmouth limestone to elevation 920 using jackhammers, and by picking and barring. The bottom width was 40 feet and the side slopes were cut 1V on 1H. After dewatering the foundation surfaces were cleaned with three separate washes using air-water jets. Rolled impervious clay was then placed. Compaction equipment traveled parallel to the rock side slopes until the fill reached the top of rock at which time the equipment resumed the normal direction of compaction parallel to the embankment (see photos Nos. 15 thru 18 and plate No. 26).

3-08. Instrumentation. Four types of observation devices were installed in the embankment and foundation. Of 22 piezometers, tips of 13 are in the foundation clays, gravel or limestone. The remaining nine have tips in the embankment. All are the open tube type. These devices were installed during construction and are shown on plate No. 30. In June 1964, six crest settlement monuments were installed at the top of the dam, 14 feet downstream of the centerline. Two are located in the buried channel reach at stations 30+50 and 33+00. The other four are located at 1,500-foot intervals, starting at station 40+00. In February 1972, twenty-five horizontal alignment monuments were installed. The monuments are on 200-foot centers on a line 100 feet downstream of the centerline and extend across the valley from station 26+00 to station 74+00. Instrument monuments are located at each end of the line.

TABLES

TABLES

TABLE I - GROUTING SUMMARY - POMONA DAM

STAGE I CONTRACT

<u>Grout Stage</u>	<u>Zone</u>	<u>Grout Hole Drilling Lineal Feet</u>	<u>Cubic Feet Cement Placed</u>
Primary	1	914.0	172
Secondary	1	975.0	65
Tertiary	1	<u>695.0</u>	<u>44</u>
Total	1	2,584.0	281
Primary	2	1,830.0	866
Secondary	2	1,474.0	134
Tertiary	2	<u>232.0</u>	<u>13</u>
Total	2	3,536.0	1,013
Primary	3	626.0	616
Secondary	3	609.0	27
Tertiary	3	<u>0.0</u>	<u>0</u>
Total	3	1,235.0	643
Total Primary		3,370.0	1,654
Total Secondary		3,058.0	226
Total Tertiary		<u>927.0</u>	<u>57</u>
Total (all zones)		7,355.0	1,937

COMPLETION OF EMBANKMENT CONTRACT

<u>Grout Stage</u>	<u>Zone</u>	<u>Lineal Footage Drilled</u>	<u>Cubic Feet Cement Placed</u>
Primary	1	254.0	25
Secondary	1	250.0	0
Tertiary	1	<u>29.0</u>	<u>0</u>
Total	1	533.0	25
Primary	2	268.0	4
Secondary	2	241.0	2
Tertiary	2	<u>0.0</u>	<u>0</u>
Total	2	509.0	6
Total Primary		522.0	29
Total Secondary		491.0	2
Total Tertiary		<u>29.0</u>	<u>0</u>
Total (all zones)		1,042.0	31

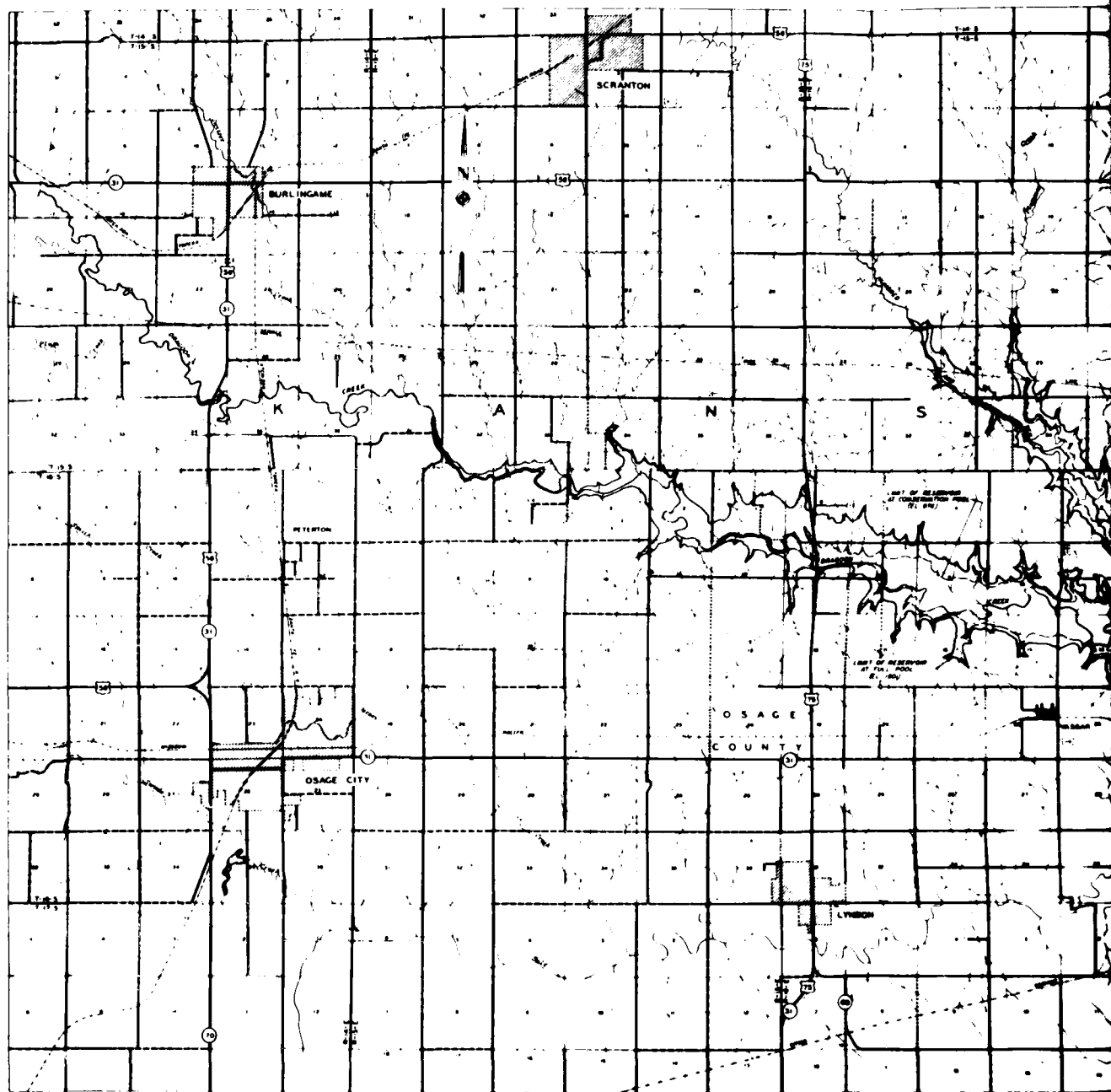
TABLE II - LABORATORY TESTS ON BEDROCK - POMONA DAM

Member	Vertical Compression		Ton/Ft. 2		Dry weight #/Ft. 3		Moisture Content % Dry Weight		MgSO <sub>4</sub> (5 Cycles)	
	No of Tests	Avg.	Max.	Min.	No. of Tests	Avg.	No. of Tests	Avg. %	No. of Tests	Avg. %
Bell Limestone	1	324	-	-	1	160	1	2.0	-	-
Queen Hill Shale	1	154	-	-	1	117	1	8.0	-	-
Doniphan Shale	8	15	51	1.5	8	180	1	12.0	-	-
Spring Branch										
Zone A	2	257	423	100	2	151	2	4.5	-	-
Zone B	2	12	13.5	11	2	130	2	12.0	-	-
Zone C	1	632	-	-	1	165	1	0.5	1	0.40
Stull Shale	5	53	138	24	5	135	5	9.6	-	-
Clay Creek Limestone	1	603	-	-	1	166	2	3.6	-	-
Jackson Park Shale	9	98	338	31	9	140	9	7.4	-	-
Kereford Limestone	6	500	590	288	7	162	8	3.0	3	13.93
Heumader Shale	17	27.5	66	8	19	134	19	9.9	-	-
Plattsmouth Limestone	14	615	810	356	14	158	14	3.2	9	3.77
Heebner Shale	13	181	338	37	13	132	14	6.8	-	-
Leavenworth Limestone	3	250	370	91	3	158	3	1.6	-	-
Snyderville Shale	10	41	93	17	13	144	13	7.7	-	-
Lawrence Shale	5	36	56	22	5	136	5	7.7	-	-

T-2

**DRAWINGS**

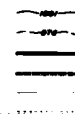
**DRAWINGS**



VICINITY  
SCALE IN FEET  
0 4000 8000 12000

LEGEND

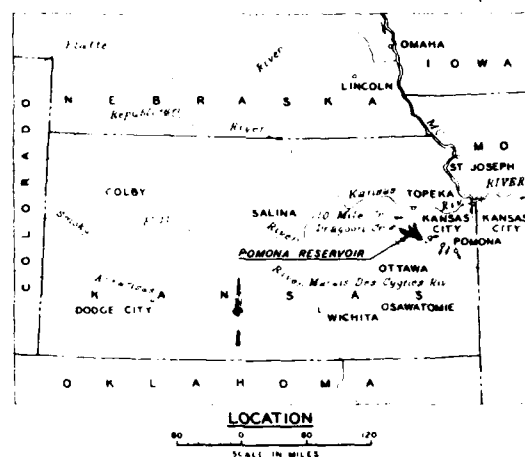
Full pool  
Conservation pool  
Concrete or bituminous pavement  
Improved road  
Graded road  
Trail



GENERAL

This map compiled from the  
Highway map, supplemented by  
Engineers photogrammetric survey  
reservoir area





This map compiled from the Kansas State General Highway map, supplemented by the U S Army Corps of Engineers photogrammetric surveys covering the reservoir area.

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
COMPLETION OF EMBANKMENT

In 29 sheets Sheet No. 1  
U. S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Scale: as shown  
KANSAS CITY, MO.  
SEPTEMBER 1990

PLATE NO. 1



## RECORD DRAWING

OCTOBER 1992

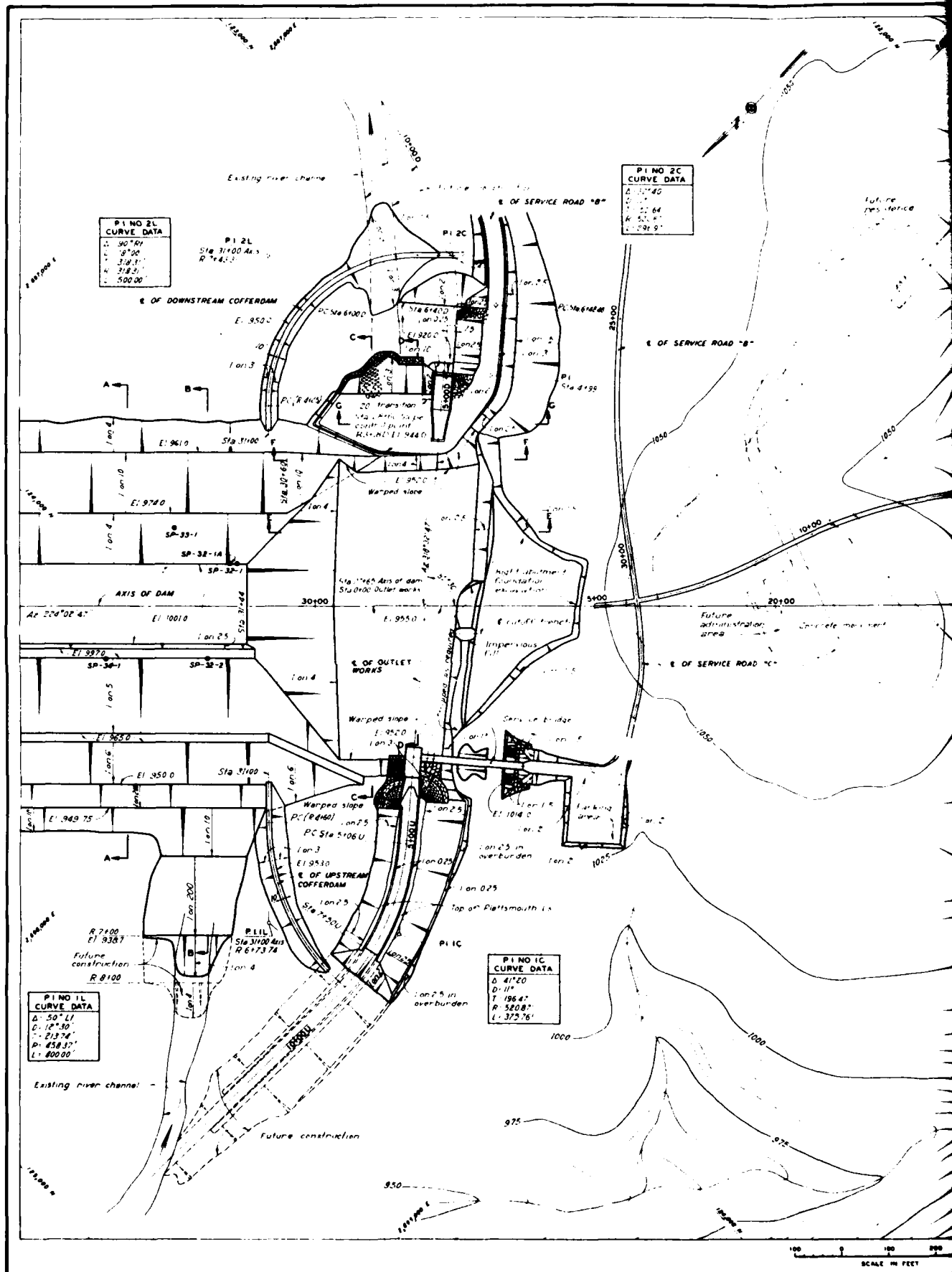
CONTACT: 800-834-4262 • 714-940-0100

Submitted: *[Signature]*  
 Char. Drafting Section  
 Drawn by: JFH  
 Traced by: JAW

Recommended: *[Signature]*  
 Chief Engineering Division  
 Checked by: H.L.

Scale: as shown  
KANSAS CITY, MO.  
SEPTEMBER 1990

Approved:  
*E. E. Harrison*  
 Col., U. S. Army, Engineer  
 File No.  
 0-2-47



MARCH 1962

CONTRACT NO. DA 23-028 CIVE NG 59-551

SYN	Revised for Built conditions	DATE	APP'D
DESCRIPTION		REVISIONS	

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

STAGE 1 CONSTRUCTION

PLAN OF WORK AREA  
EMBANKMENT, OUTLET WORKS & SPILLWAY

in 80 sheets  
U S ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No 4

Scale as shown  
KANSAS CITY, MO  
APRIL 1959

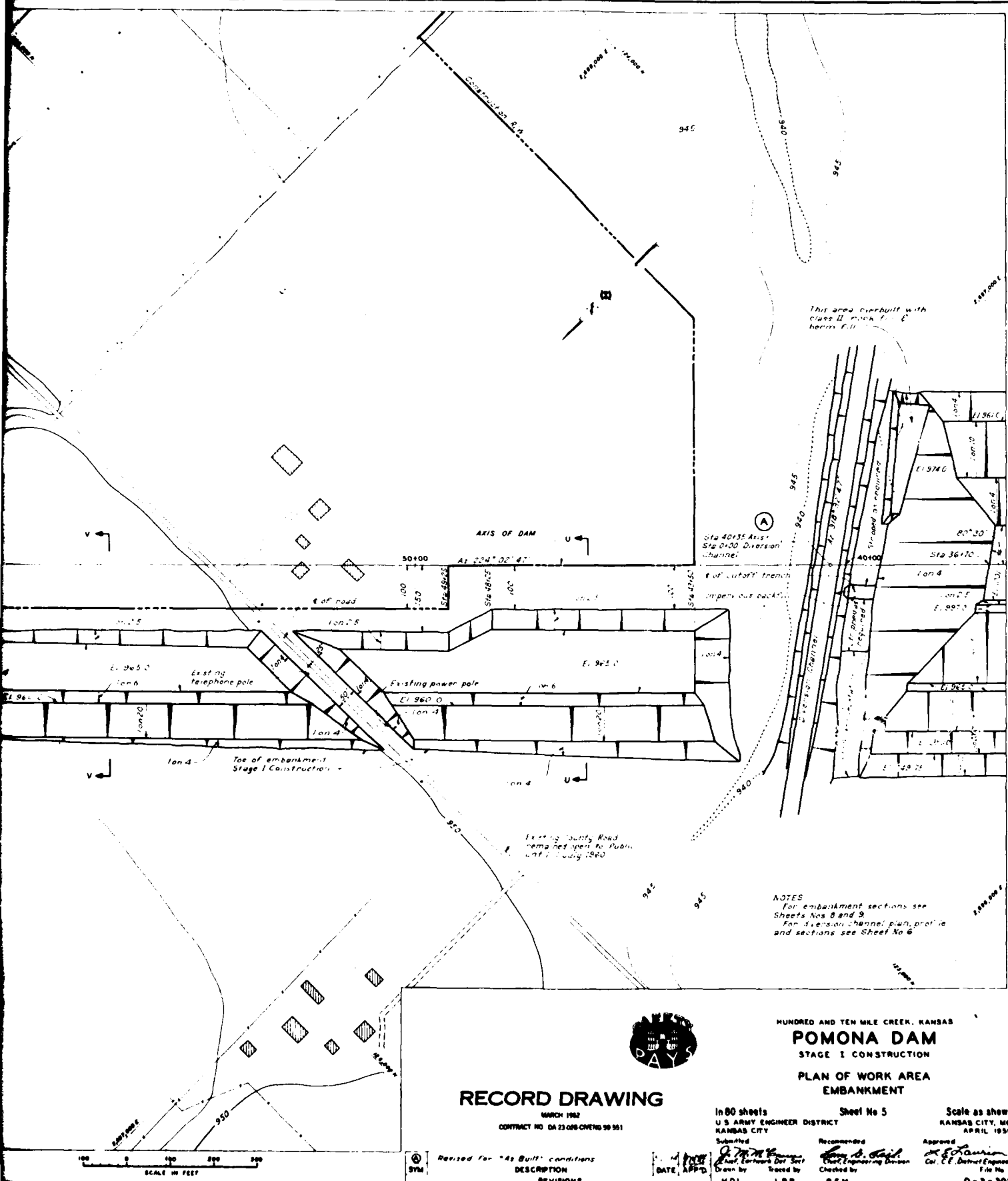
Submitted  
J. M. McLean  
Chief, Earthquake Div. East  
Drawn by Traced by  
MOL QHR-GBW

Recommended  
*James S. Paul*  
 Chief, Engineering Division  
 Checked by  
 PEM

Approved  
*R. E. Larson*  
 Ch. E. District Engineer  
 File No.  
 O - 3 - 304

PLATE NO. 2

[illegible]



# RECORD DRAWING

MARCH 1962  
CONTRACT NO. DA 23-008-CHENG 90 561



Revised for "As Built" conditions  
DESCRIPTION  
REVISIONS

DATE  
APPROVED

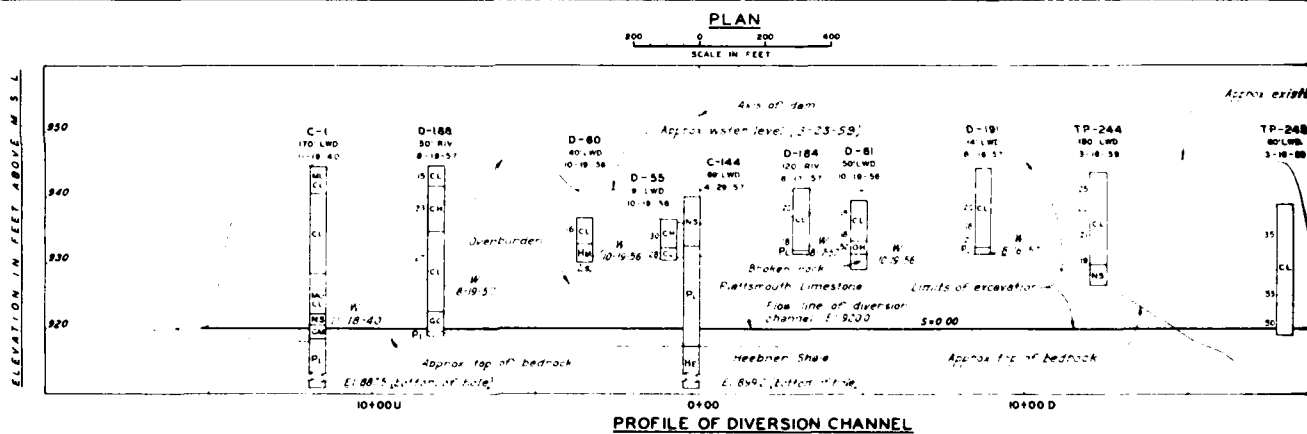
In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY  
Submitted  
Checked by  
HDL LBR PEM

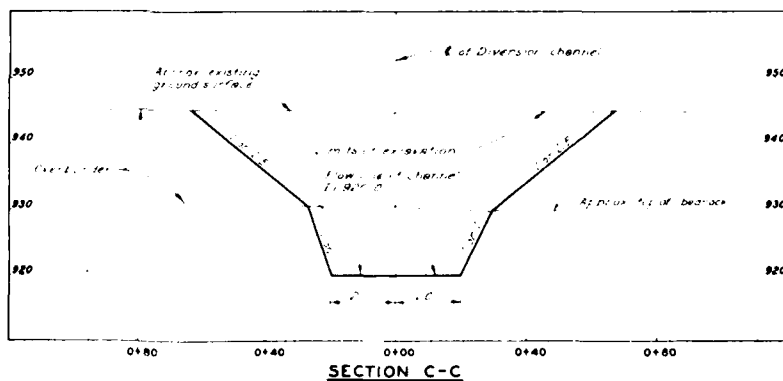
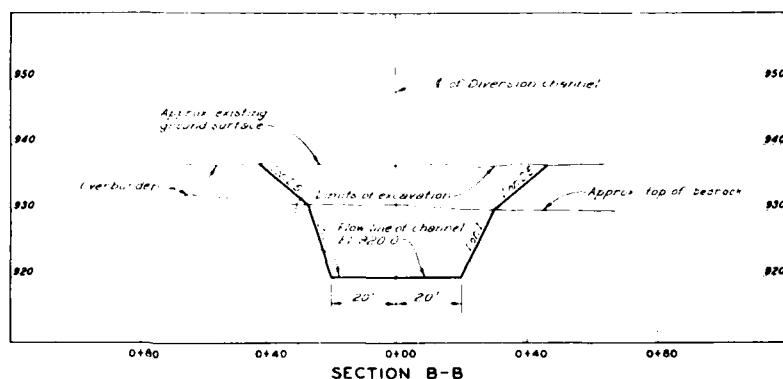
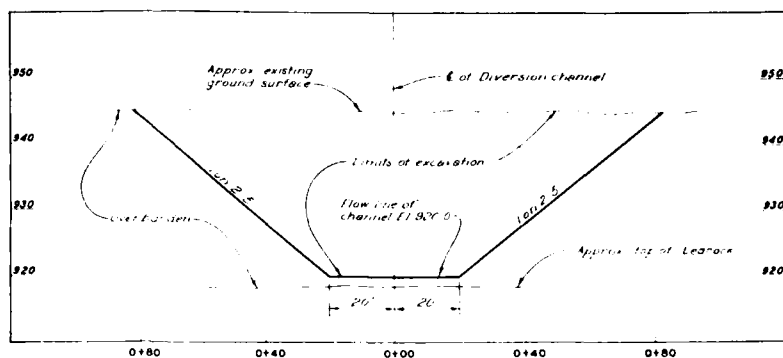
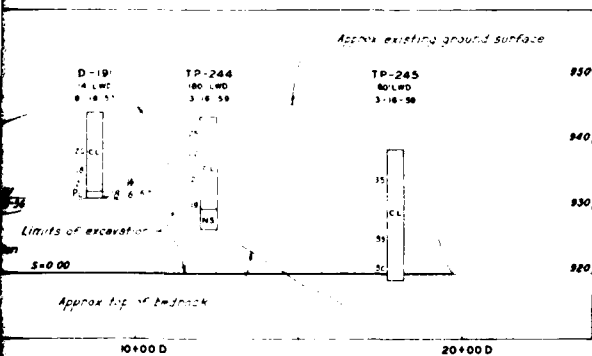
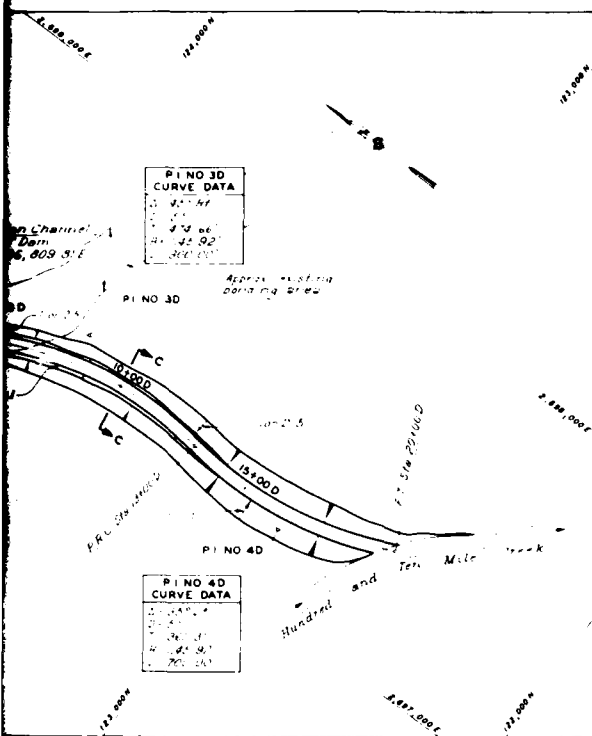
Sheet No 5

Recommended  
Checked by  
PEM

Approved  
Col. E. E. Doherty, District Engineer  
File No.

PLATE NO. 3





**NOTES**  
 For legend of logs see Sheet No. 16  
 For other logs or underground  
 explorations see Sheets Nos. 5, 16 & 17  
 For location of borings see Sheet No. 15

## RECORD DRAWING

MARCH 1962  
 CONTRACT NO. DA 23 028 CRENG 59 551

SYMBOL	DESCRIPTION	DATE	APP'D
Revised for "As Built" conditions			

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
 STAGE I CONSTRUCTION  
 DIVERSION CHANNEL  
 EXCAVATION

In 80 sheets  
 U.S. ARMY ENGINEER DISTRICT  
 KANSAS CITY

Sheet No. 6

Scale as shown  
 KANSAS CITY, MO  
 APRIL 1959



Submitted by *J. M. M. Kane*  
 Checked by *F. E. G.*  
 Drawn by *H. D. L.*  
 Recommended by *J. M. M. Kane*  
 Checked by *P. E. M.*

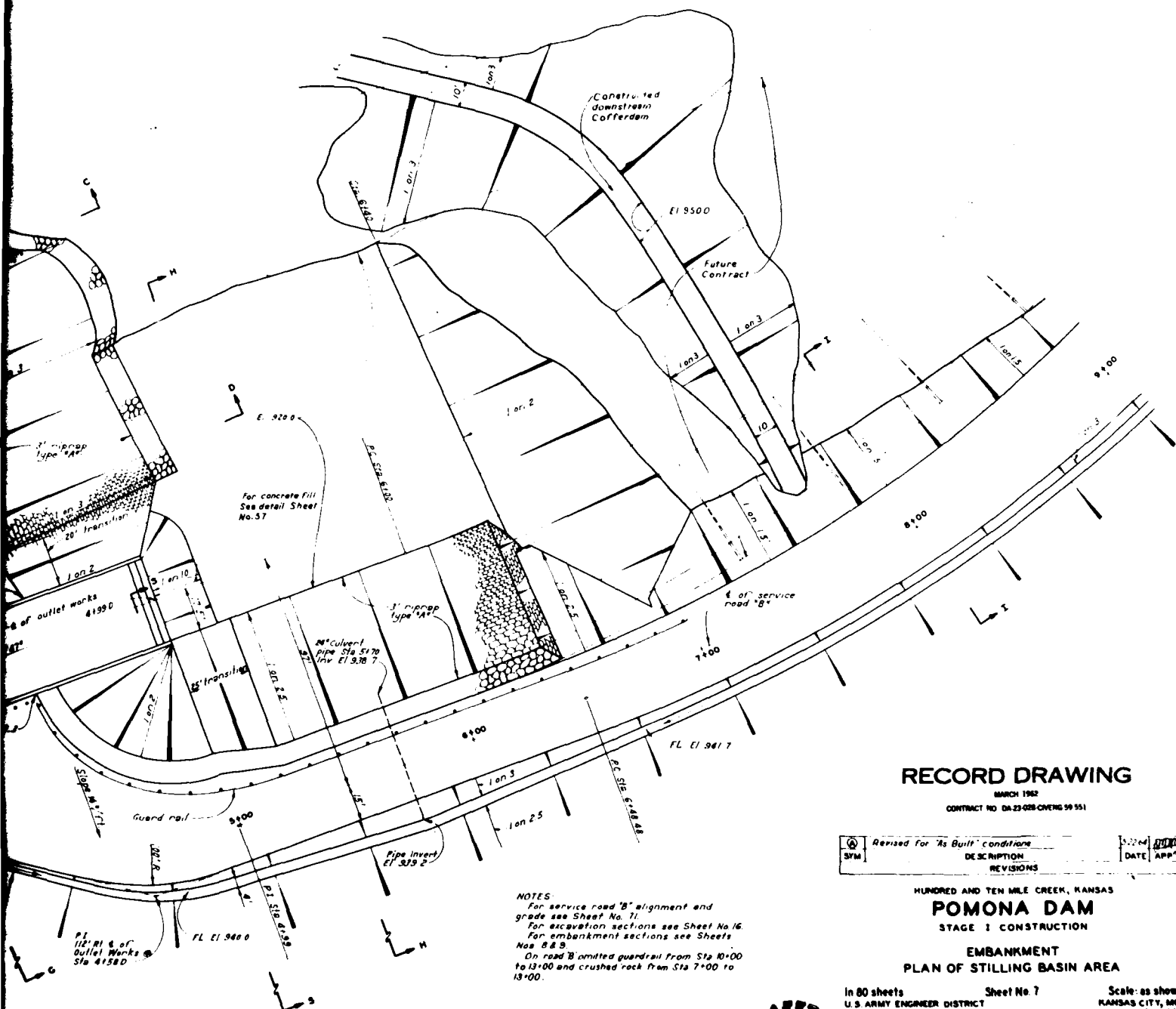
Approved by *J. M. M. Kane*  
 CO, CE, District Engineer  
 File No. *O-3-308*

PLATE NO. 4





SCHEDULE OF GUARD POSTS			
LOCATION	NO	SPACING	SIDE
Stillage basin	33	5'cc	1 & Rt



## MARCH 1962

CONTRACT NO. DA-23-028-CNENG 99 551

SYM	Revised for "As Built" conditions	DATE	APP'D
	DESCRIPTION		
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

### STAGE 1 CONSTRUCTION

EMBANKMENT  
PLAN OF STILLING BASIN AREA

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 7

Scale: as shown  
KANSAS CITY, MO.  
APRIL 1938

Submitted

### Recommended

**Approved**

Q. M.

*Love*

✕✕✕

**Prof. Earl**

Chock Engine  
Checked by

Cal. C.E.

MDA

CLASSIFIED BY  
R E M

PLATE NO. 8

The diagram illustrates a cross-section of a dam structure, labeled 'SECTION C-C STA. 28+1'. The horizontal axis represents the 'RANGE' from 5+00 (UPSTREAM) to 10+00 (DOWNSTREAM). The vertical axis shows elevations from 920 to 1080.

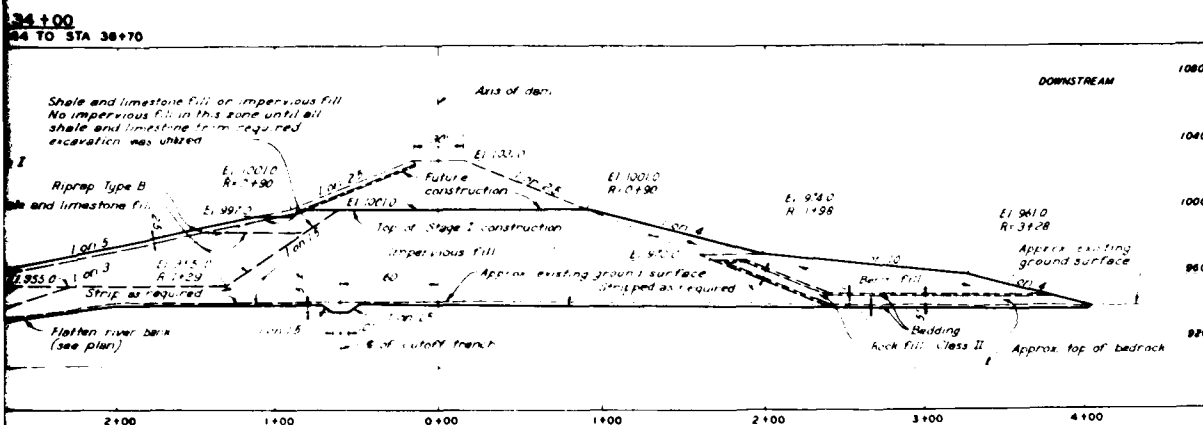
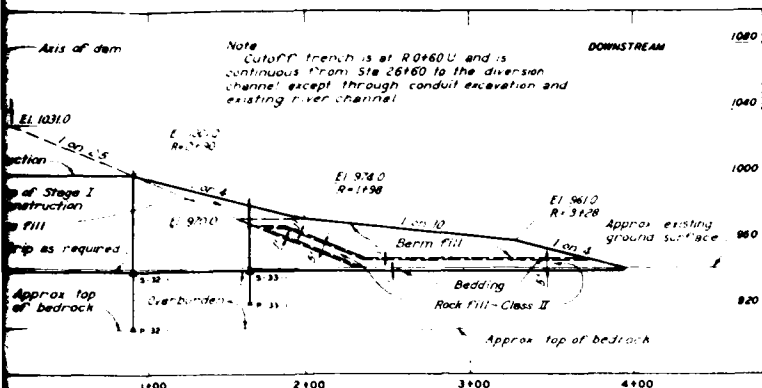
Key features and construction details include:

- UPSTREAM:** The left side of the diagram, with a 'Riprap Type B' area and an 'Approx. existing ground surface' line.
- EL 960.0 R=37.32:** A curve radius specification for the upstream slope.
- EL 1001.0 R=01.90:** A curve radius specification for the crest area.
- EL 1031.0:** The elevation of the 'Axis of dam'.
- EL 955.0 R=01.60:** A curve radius specification for the downstream slope.
- Future construction:** Indicated by a dashed line showing the planned profile.
- Top of Stage I construction:** A solid line representing the current construction stage.
- Impervious fill:** A horizontal layer within the dam body.
- Stripped as required:** Areas where material has been removed.
- Approx. top of bedrock:** A dashed line indicating the underlying geological feature.
- Berm fill begins at Sta. 29+00:** A note about the downstream slope.
- 6' of cutoff trench:** A detail of the trench at the downstream toe.
- Axis of dam:** The central vertical line of the dam structure.

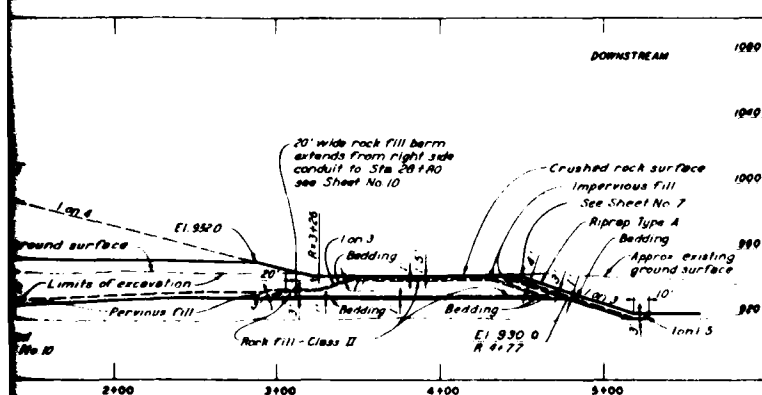
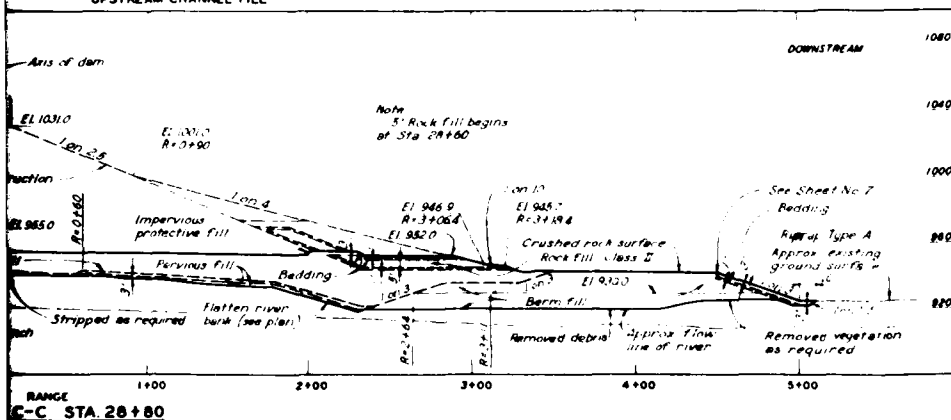
The diagram uses various line styles (solid, dashed, dotted) to represent different construction stages and geological features. Slopes are indicated by ratios such as 1 on 1.5, 1 on 3, 1 on 5, and 1 on 2.5.

[illegible]

**SECTION D-D STA. 27+00**



SECTION B-B STA 32+30  
UPSTREAM CHANNEL FILL



NOTES  
For plan of embankment  
see Sheets Nos 4 & 5  
For plans of interior embankment  
routel works downstream see Sheet No 6

## RECORD DRAWING

MARCH 1962

CONTRACT NO. DA 22-026 CIVENG 98 551

SYMBOL	DESCRIPTION	DATE	APPROVED
	Revised for "As Built" conditions		
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
STAGE I CONSTRUCTION

EMBANKMENT  
SECTIONS

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No 8

Scale as shown  
KANSAS CITY, MO  
APRIL 1958



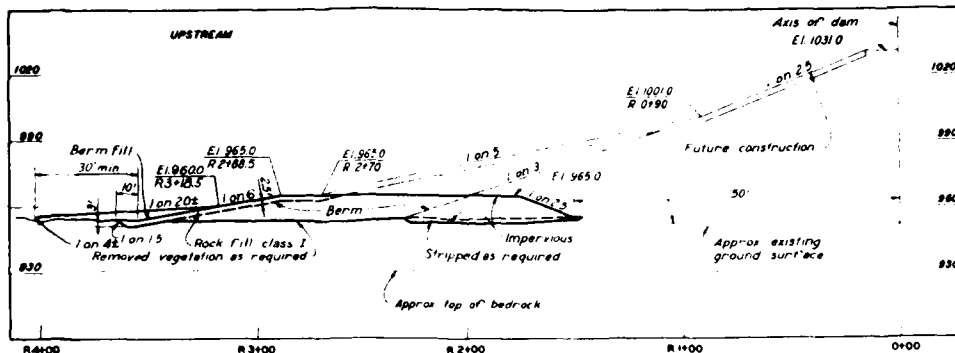
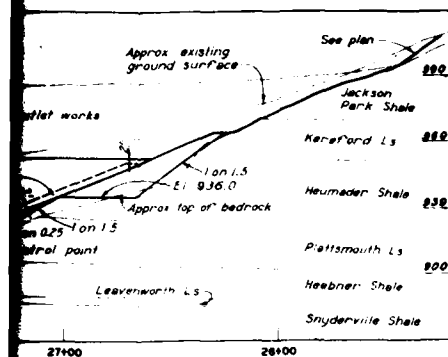
Submitted  
Chief, Earthwork Dist. Serv.  
Drawn by  
HOL REC

Recommended  
Chief, Engineering Division  
Checked by  
PEM

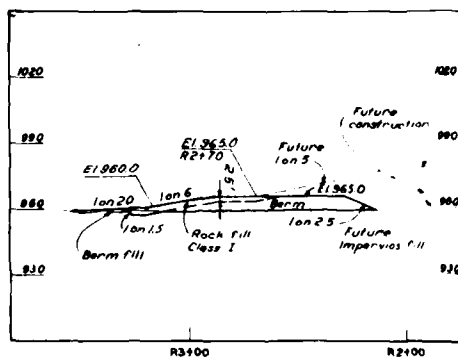
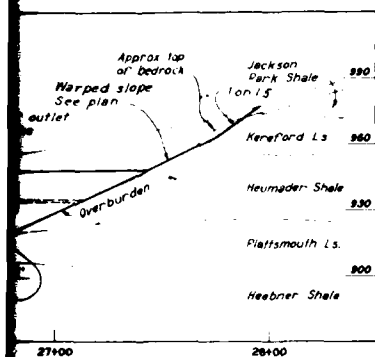
Approved  
Chief, District Engineer  
File No.  
O-3-308

PLATE NO. 6

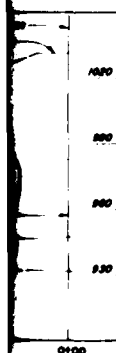
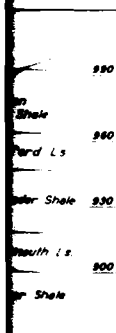
SECTION U-U  
TYPICAL - STA 43+50 TO STA 48+25



SECTION V-V  
TYPICAL - STA 48+25 TO STA 80+50



SECTION A-A



NOTES:  
For plan of embankment see Sheets Nos 4 & 5  
For control point details see Sheet No 11.

## RECORD DRAWING

MARCH 1962  
CONTRACT NO DA 25-088-ORING 99-951

SYN	Revised for "As Built" conditions	DATE	APPD
	DESCRIPTION		
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
STAGE I CONSTRUCTION

EMBANKMENT  
SECTIONS

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No 9

Scale: as shown  
KANSAS CITY, MO  
APRIL 1959



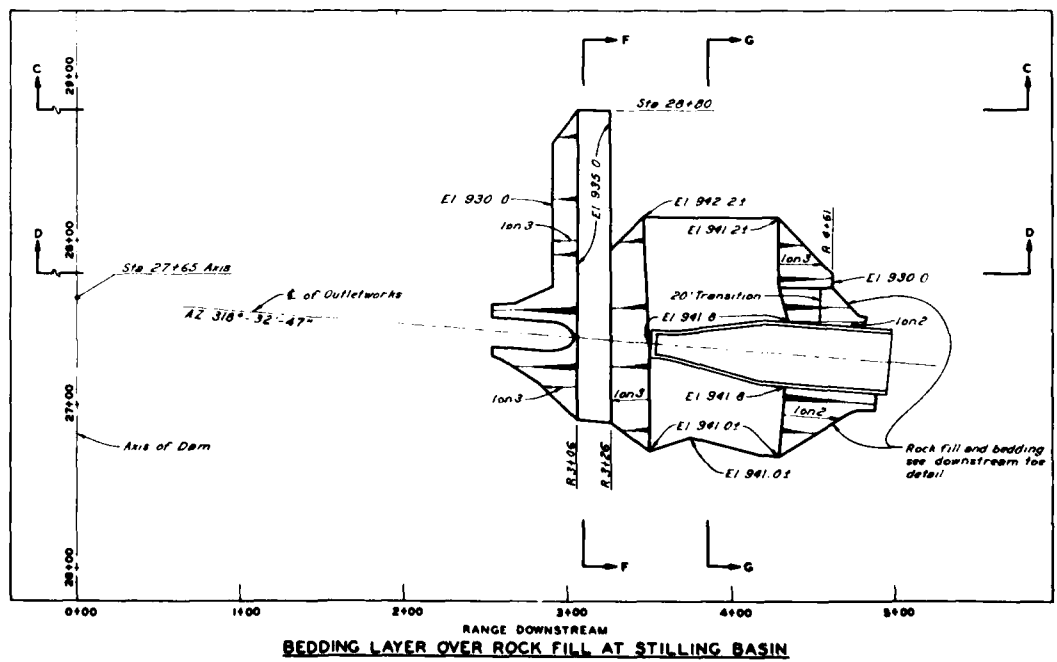
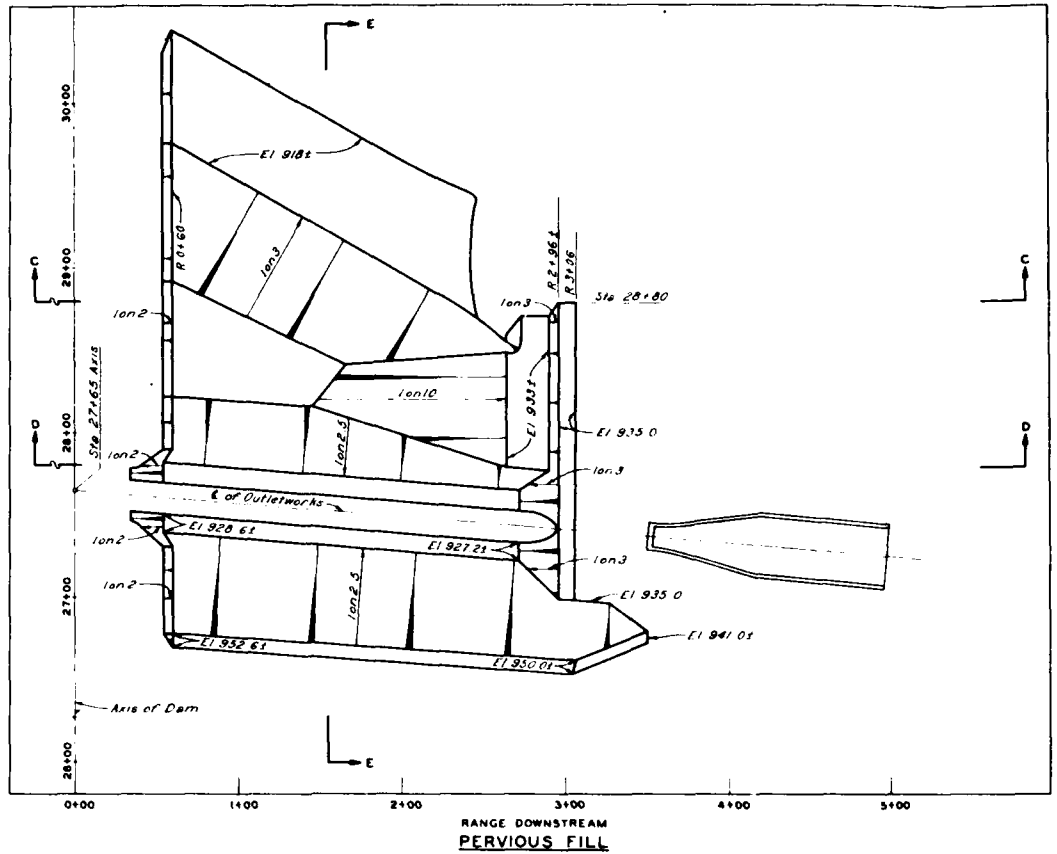
Submitted  
J. M. D. [Signature]  
Chief, Fort Worth Dist. Sect.  
Drawn by  
N.D.L. G.W.

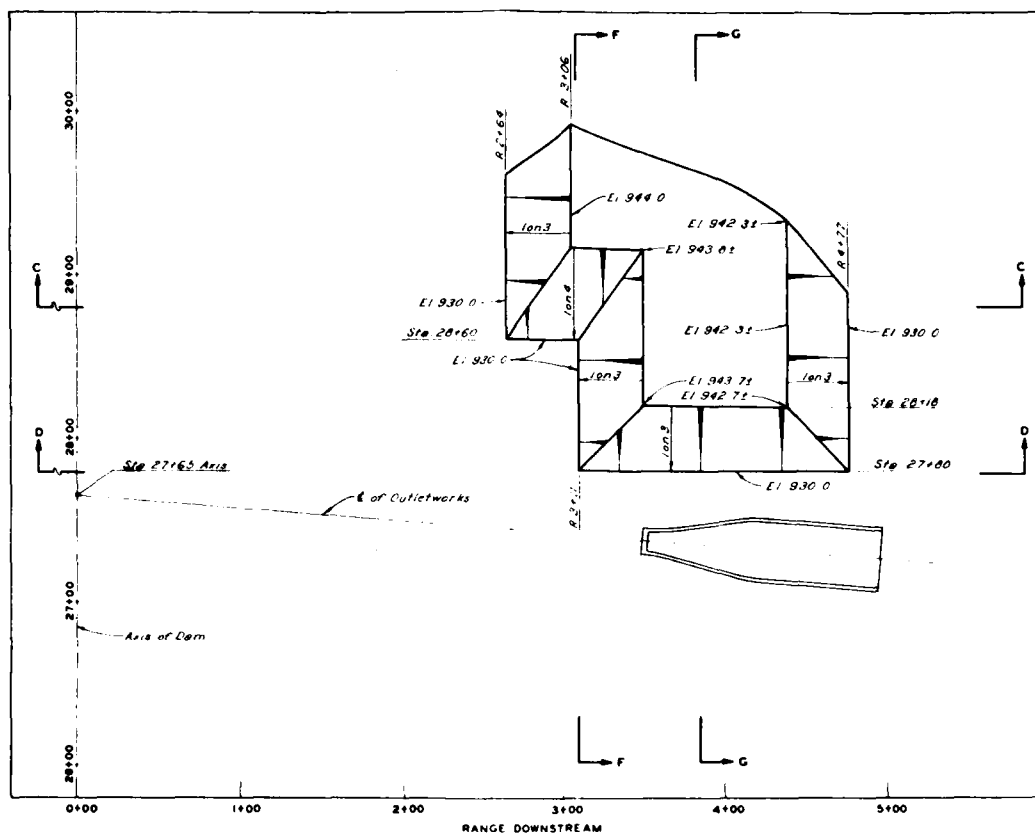
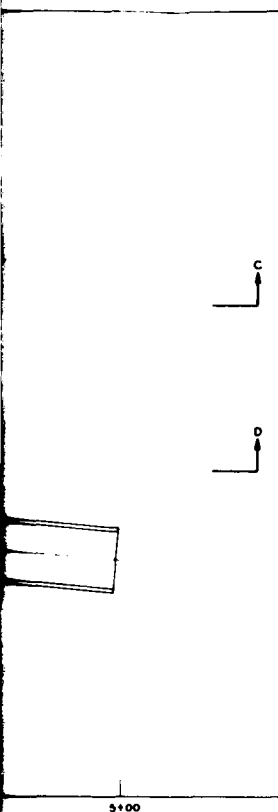
Recommended  
R. B. [Signature]  
Chief, Engineering Division  
Checked by  
P.E.M.

Approved  
R. E. [Signature]  
Col., C.E. District Engineer  
F. H. [Signature]

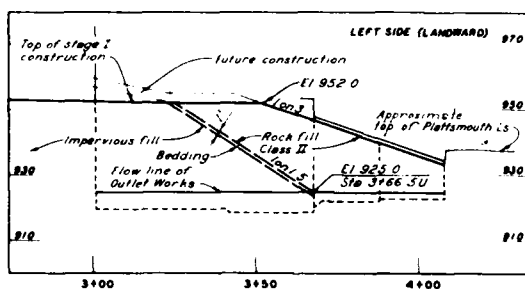
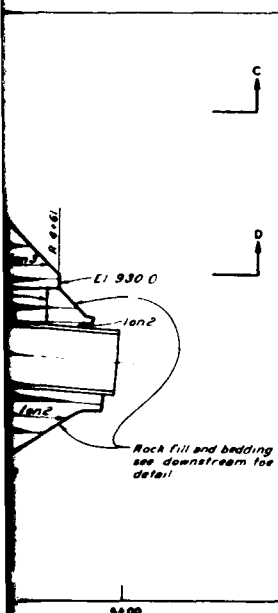
O-3-309

PLATE NO. 7

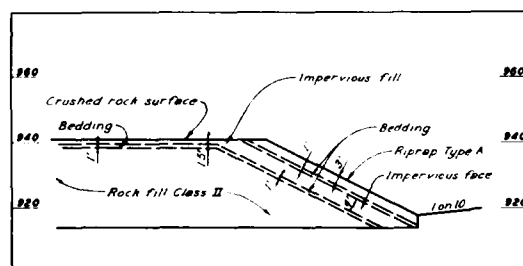




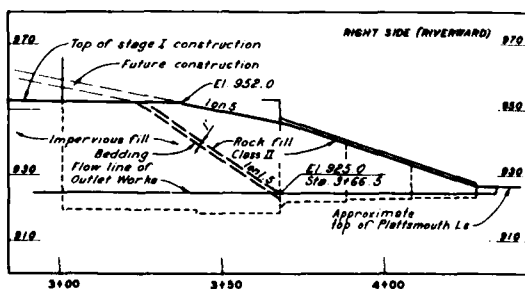
BERM FILL PRIOR TO ROCK FILL AT STILLING BASIN



DETAILS OF FILL WEST SIDE CONTROL TOWER



TOE DETAIL ADJACENT TO STILLING BASIN



DETAILS OF FILL EAST SIDE CONTROL TOWER

NOTES  
For plan at control tower see Sheet No 4  
For plan at stilling basin see Sheets Nos 4C7

SYN	DESCRIPTION	DATE	APPRO
6	Revised for "As Built" conditions	5/27/64	JMB

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
STAGE I CONSTRUCTION  
EMBANKMENT  
INTERIOR PLANS AND DETAILS



In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY  
Submitted by: [Signature]  
Checked by: [Signature]  
H.D.L. F.E.G. P.E.M.

Sheet No 10  
Scale as shown  
KANSAS CITY, MO  
APRIL 1959

Approved: [Signature]  
Col. C. F. Blair, Jr., Engineer  
9th Div.

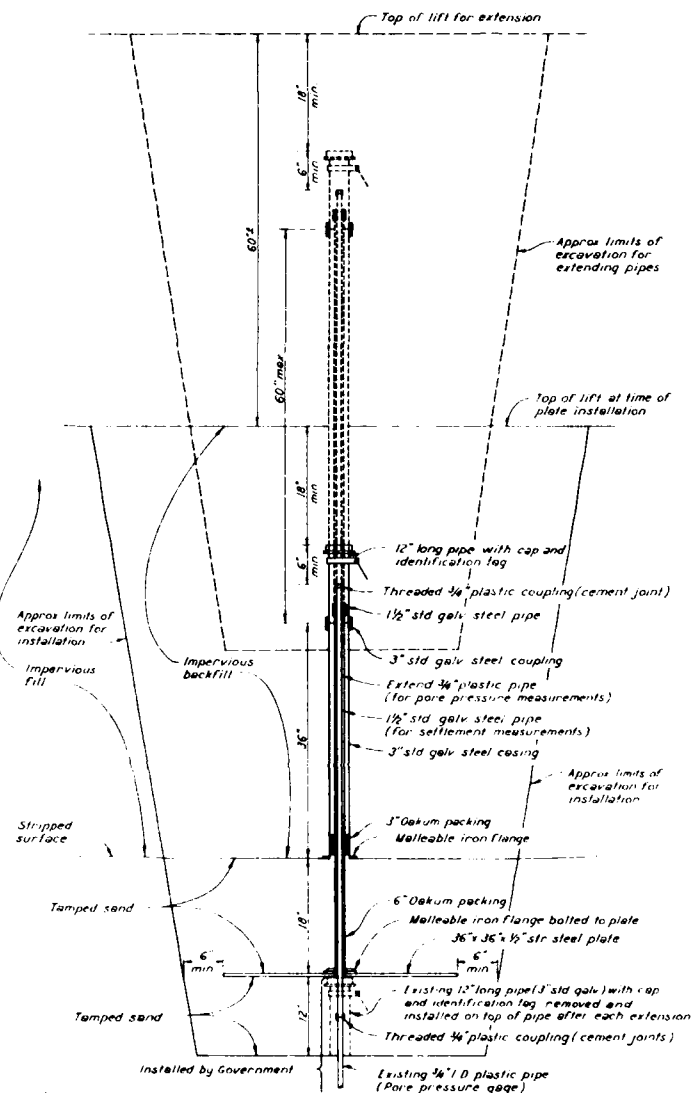
**RECORD DRAWING**

MARCH 1960  
CONTRACT NO. DA-23-082-CH210-22-001

PLATE NO. 8

## Note

Pipes extend 36" minimum above the finished embankment grade. The 3" outer casing painted alternating black and chrome 6" bands and provided with a 3" brass plug with 1/8" hole.



Note  
Pipes centered to maintain clearance  
The space between the 3" casing and the 1/2" settlement pipe filled with heavy grease  
Ends of all pipe sections reamed smooth, removing all burrs

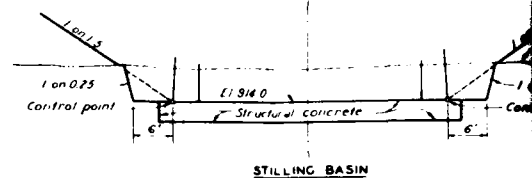
### SETTLEMENT PLATE INSTALLATION AND PORE PRESSURE GAGE EXTENSION DETAIL

SETTLEMENT PLATE DATA				
NUMBER	STATION	RANGE	PLATE APPROX. ELEV.	EXTENSION APPROX. LENGTH
S-32-1	31+70	0+900	940.0	66'
S-32-2	32+30	1+120	944.0	56'
S-31-1	33+00	1+650	943.0	40'
S-34-1	34+50	1+120	943.5	57'
P-32-1A	31+76.02	0+900.00	No Plate	
P-148-1	34+80	1+450		
P-348-2	34+80	0+200		
P-348-3	34+80	0+320		

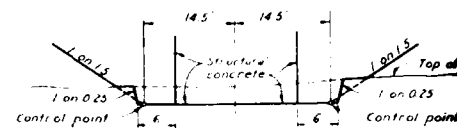
Gages plotted on plan, Sheet No. 4  
\* Installed by Government, extended by Contractor

NOTE  
If 1/2" plastic pipe in pore pressure gage damaged, installed P-32-1A to replace same

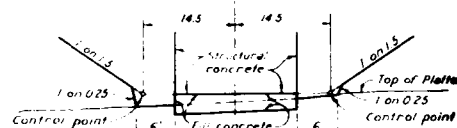
LEFT (EAST)



STILLING BASIN



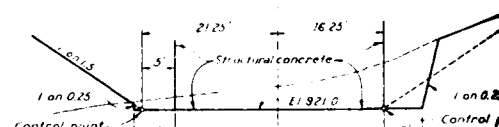
CONDUIT



CONDUIT

LEFT (EAST)

RIGHT (WEST)



TOWER

### OUTLET WORKS EXCAVATION CONTROL DETAILS

OUTLET WORKS TABLE OF CONTROL POINTS FOR EXCAVATION LEFT SIDE OF CENTERLINE LOOKING DOWNSTREAM				
STATION	ELEVATION	DIST. FROM CENTERLINE	BACKSLOPE	
7+50 U to 5+00 U	925.0	5'	1 on 2.5	
5+00 U to 4+32 U	925.0	Varies	1 on 2.5	
4+32 U	925.0	17.5	1 on 2.5	
4+32 U to 4+26.5 U	925.0	Varies	1 on 2.5	
4+26.5 U to 3+70.5 U	925.0	Outside face stem	1 on 1.5	
3+70.5 U to 3+66.5 U	Varies	Varies	1 on 1.5	
3+66.5 U to 3+01 U	921.0	21.25	1 on 1.5	
3+01 U to 2+59 U	Bottom of struct conc.	Varies	1 on 1.5	
2+59 U to 3+55 D	Bottom of struct conc.	14.5	1 on 1.5	
3+55 D to 4+19 D	Varies	Varies	1 on 1.5	
4+19 D to 4+99 D	914.0	21.5	1 on 1.5	
RIGHT SIDE OF CENTERLINE LOOKING DOWNSTREAM				
7+50 U to 4+06.5 U	925.0	5'	1 on 2.5	
4+06.5 U to 3+70.5 U	925.0	Varies	Transition	
3+70.5 U	925.0	Outside face stem	1 on 1.5	
3+70.5 U to 3+66.5 U	Varies	Varies	1 on 1.5	
3+66.5 U to 3+01 U	921.0	16.25	1 on 1.5	
3+01 U to 2+59 U	Bottom of struct conc.	Varies	1 on 1.5	
2+59 U to 3+55 D	Bottom of struct conc.	14.5	1 on 1.5	
3+55 D to 4+19 D	Varies	Varies	1 on 1.5	
4+19 D to 4+70 D	914.0	21.5	1 on 1.5	
4+70 D to 5+24 D	Varies	Varies	Transition	
5+24 D to 6+00 D	920.0	25.6	1 on 2.5	

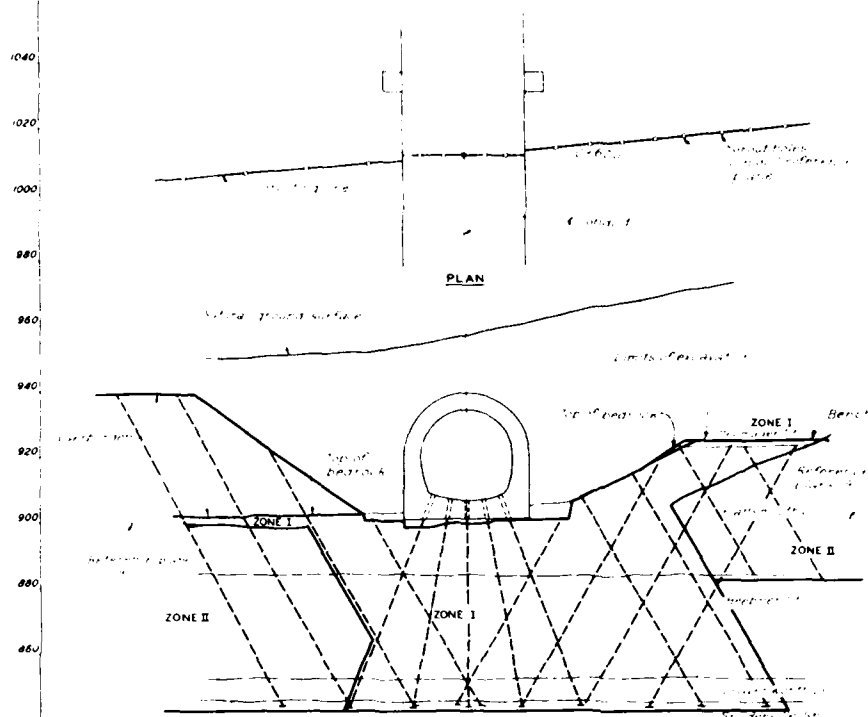
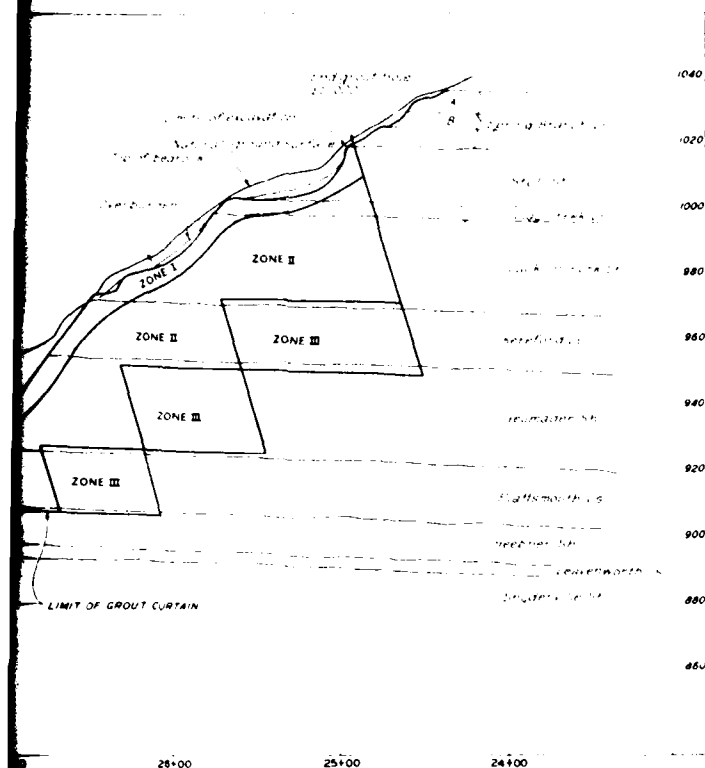
\* Backslope from Sta 4+75 D to Sta 4+99 D Left Side is warped. See plan, Sheet No.



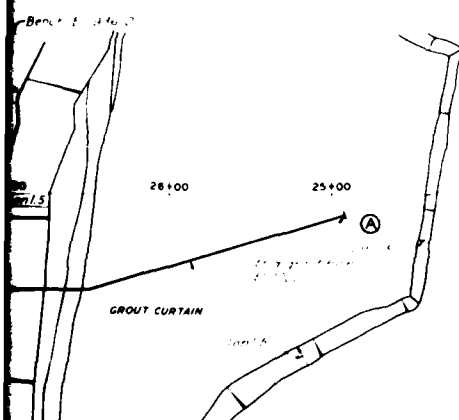




FOUNDATION GROUTING-RIGHT ABUTMENT  
Scale 1"=40'



SECTION  
**(A) CONDUIT GROUTING**  
Scale 1" = 10'

[illegible]

## RECORD DRAWING

MARCH 1962  
CONTRACT NO DA-23-028-CVENG 99 551

①	Revised for "As Built" conditions	DATE	12/1/79
A	Revision of limits of excavation (Type I)	DATE	1/1/80
SYM	DESCRIPTION	DATE	APP'D
	REVISIONS		

HUNDRED AND TEN MILE CREEK KANSAS

## POMONA DAM

### STAGE 1 CONSTRUCTION

**CURTAIN GROUTING  
PLAN AND PROFILE**

In 80 sheets  
U S ARMY ENGINEER DISTRICT  
KANSAS CITY

**Sheet No. 12**

Scale as shown  
KANSAS CITY, MO  
APRIL 1959

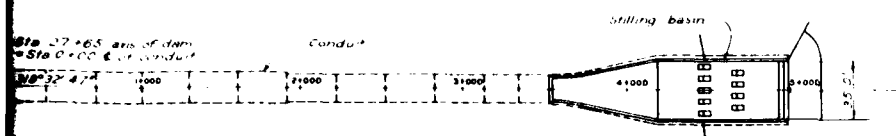
Submitted *[Signature]*  
 C&G, Geology Section  
 Drawn by Traced by  
 HRL. CHL

Recommended  
*James B. Hail*  
Chief Engineering Division  
Checked by  
C.R.G.

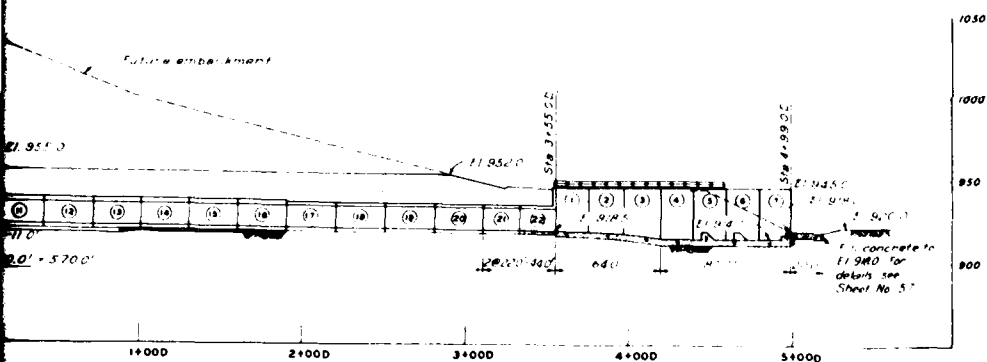
Approved  
J. E. Tamm  
Col. CE District Engineer  
J. No.  
0-3-312

PLATE NO. 10





PLAN



LONGITUDINAL SECTION

## RECORD DRAWING

 MARCH 1967  
 CONTRACT NO. DA 23-028 OVENS 59 951

 Revised for "As Built" conditions  
 SYM. DESCRIPTION REVISIONS

 DATE APP'D  
 APR 1967

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

STAGE I CONSTRUCTION

OUTLET WORKS

PLAN AND LONGITUDINAL SECTION

 In 80 sheets  
 U.S. ARMY ENGINEER DISTRICT  
 KANSAS CITY

Sheet No 13

 Scale 1"=40'  
 KANSAS CITY, MO  
 APRIL 1959

 Submitted  
 J.L.N.  
 Chief, Structural Design

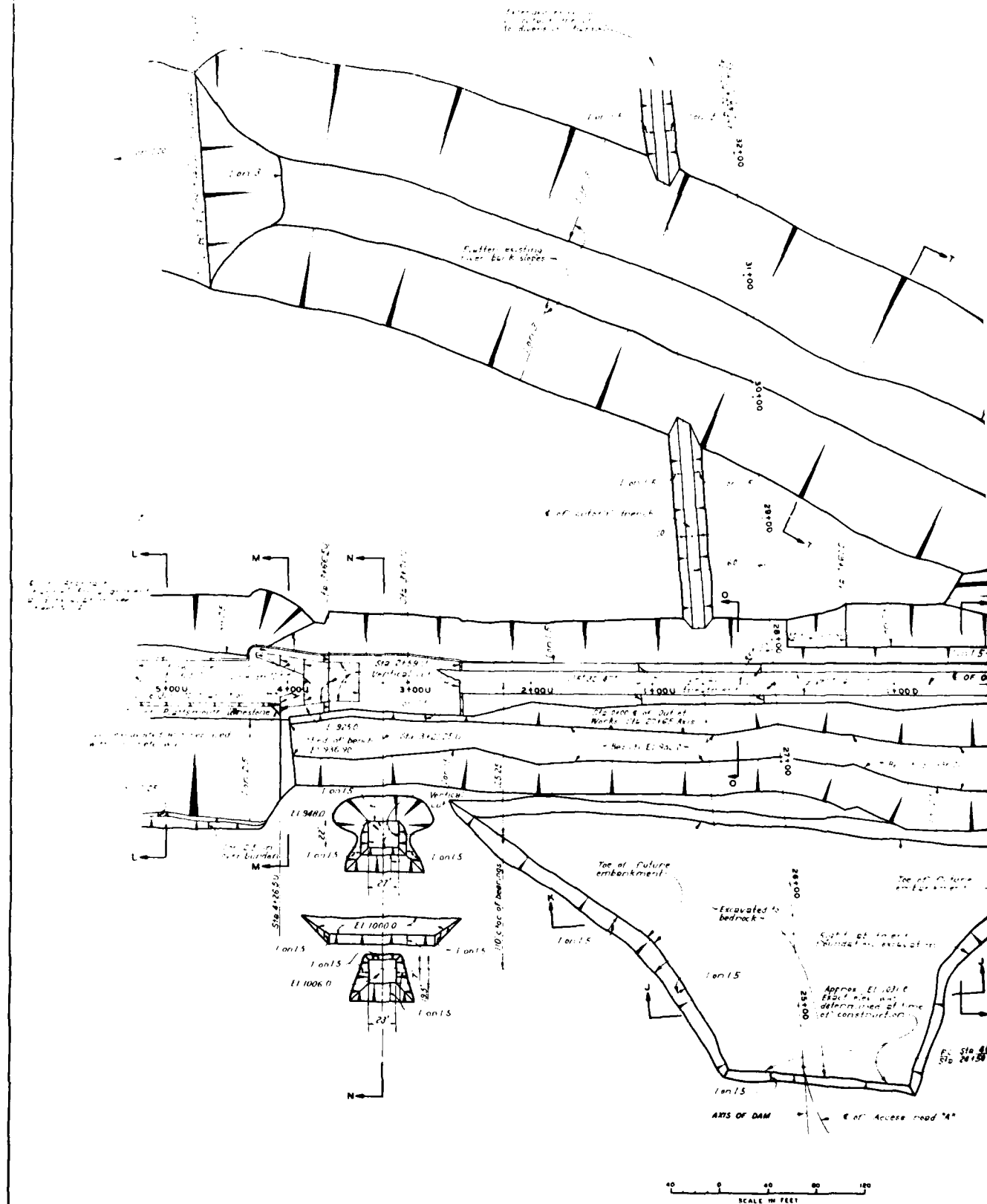
 Recommended  
 J.A.R.  
 Chief, Engineering Division

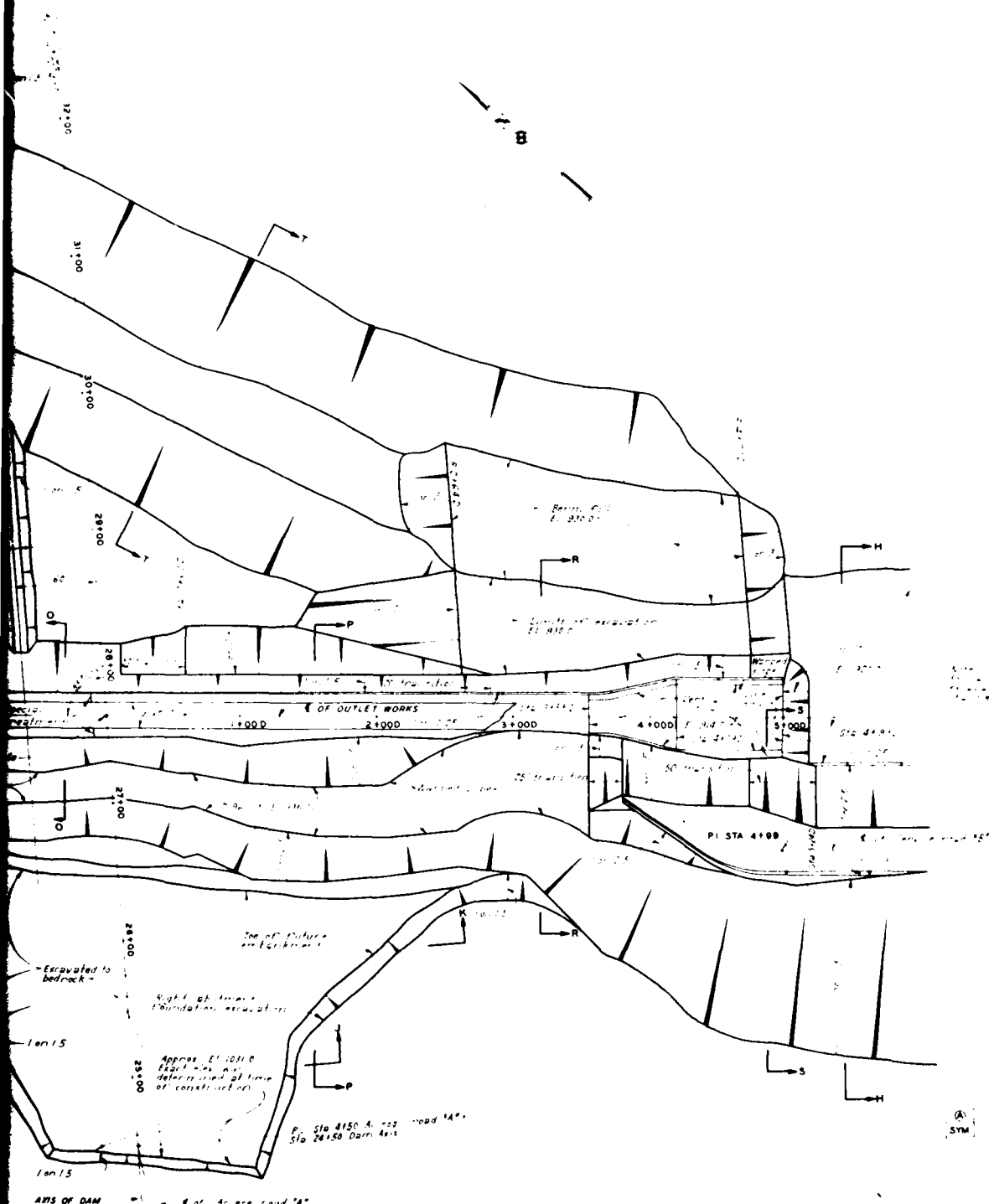
 Approved  
 E.C.B.  
 Col. C.E. District Engineer  
 File No.

Drawn by J.L.N. Traced by J.A.R. Checked by E.C.B.

Q-3-313

PLATE NO. 11





# RECORD DRAWING

MARCH 1952  
CONTRACT NO. DA 23 028 CYENG 59 551

Revised For A. B. 1011 Conditions  
SYM DESCRIPTION REVISIONS

DATE APP'D

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

STAGE I CONSTRUCTION

OUTLET WORKS  
EXCAVATION  
PLAN OF AREA

NOTES  
For excavations see sheets Nos. 15 & 16  
For profile of outlet works see Sheet No. 15

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No 14

Scale as shown  
KANSAS CITY, MO  
APRIL 1950



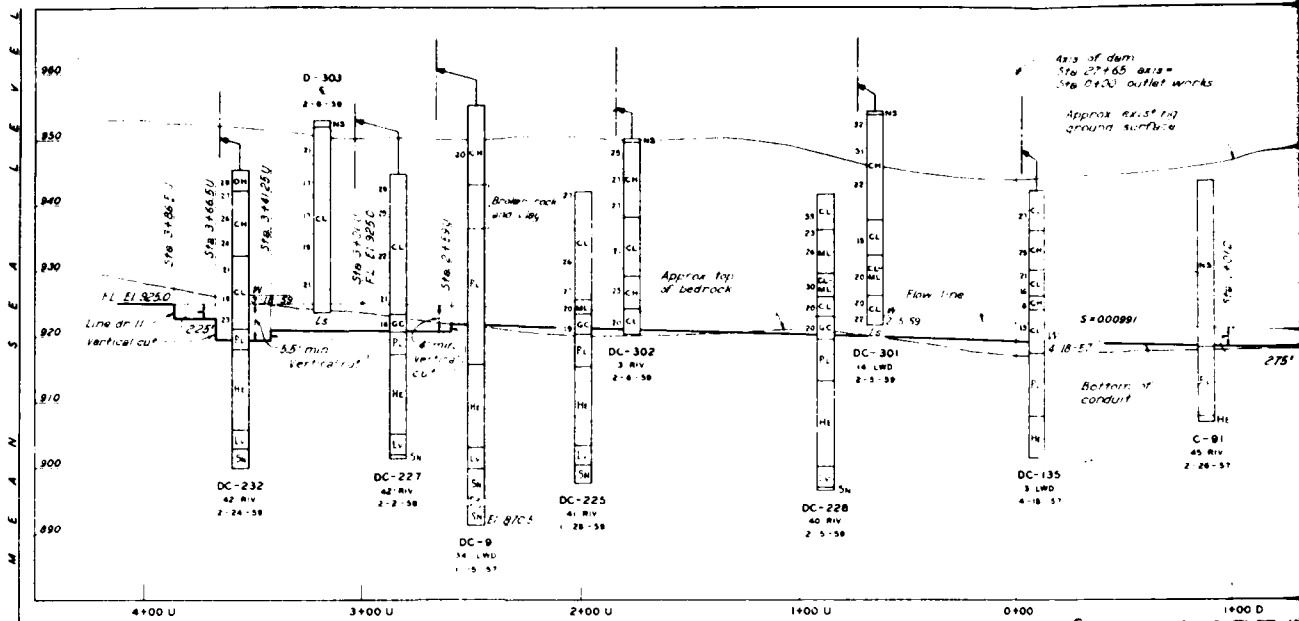
Submitted  
Chief Engineer Dist Sect  
Drawn by  
HDL

Recommended  
Chief Engineering Division  
Checked by  
DRH

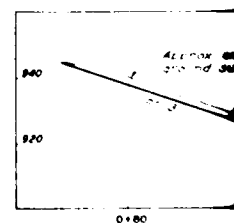
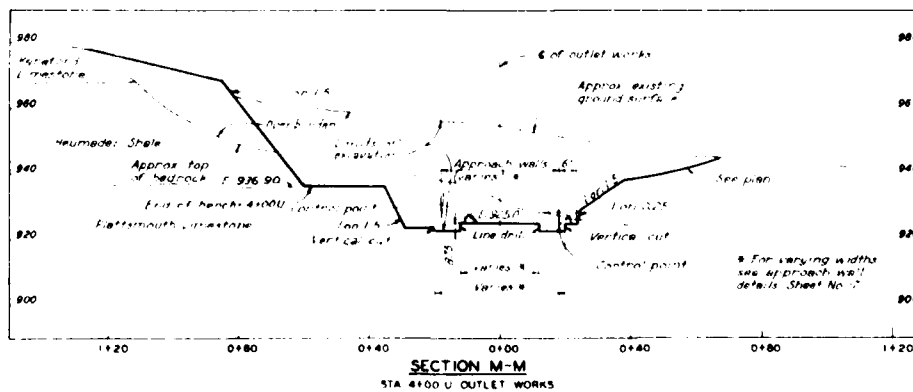
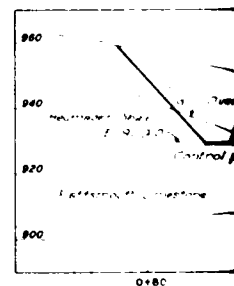
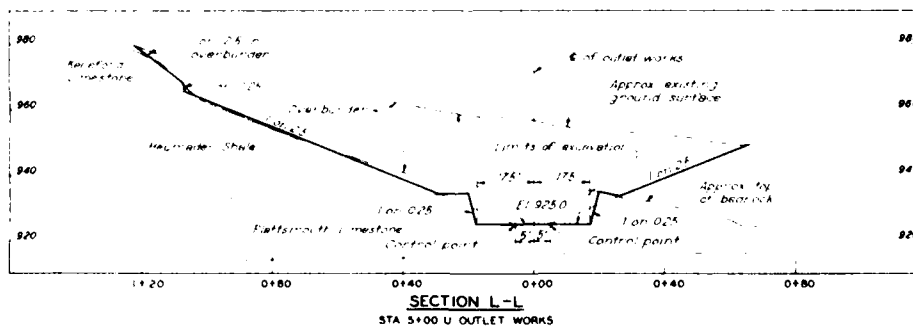
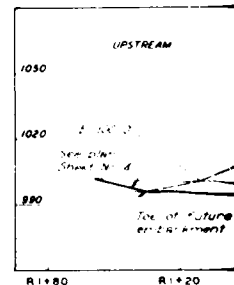
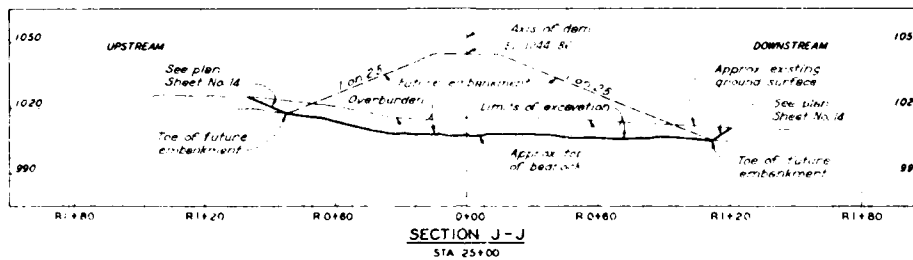
Approved  
Col. C.E. District Engineer  
File No.  
PEM

O-3-314

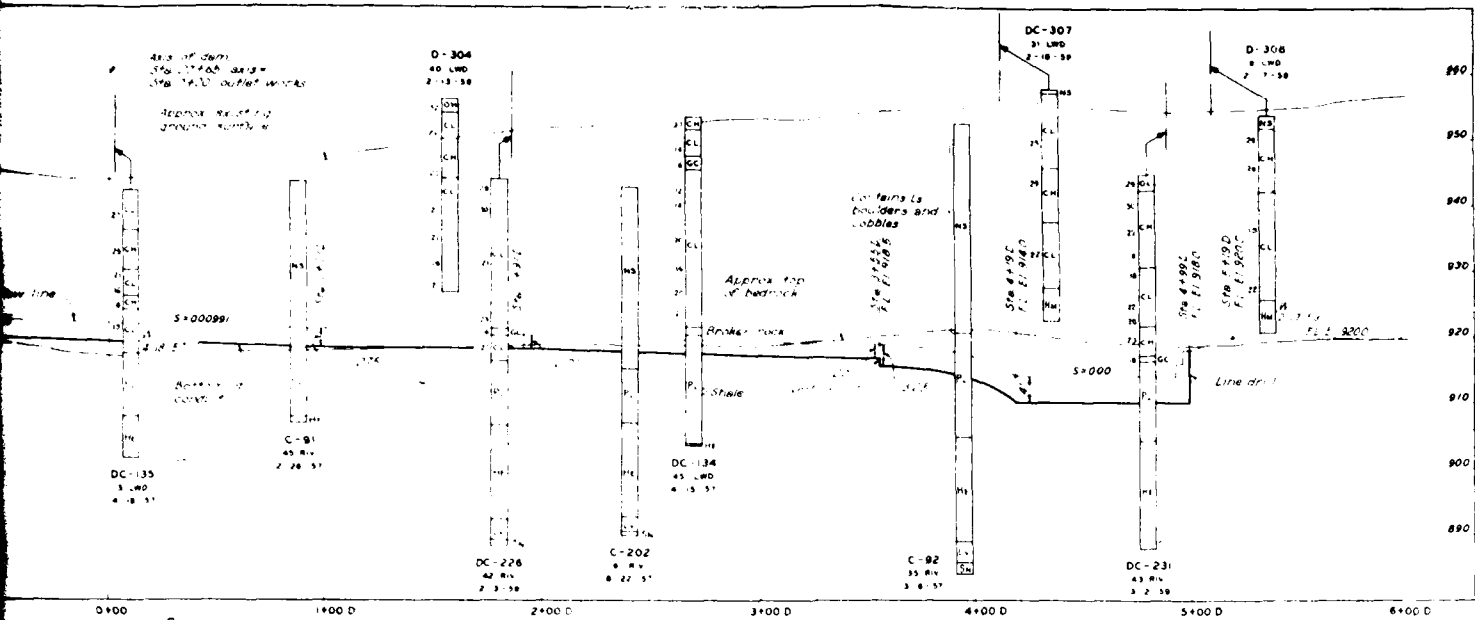
PLATE NO. 12



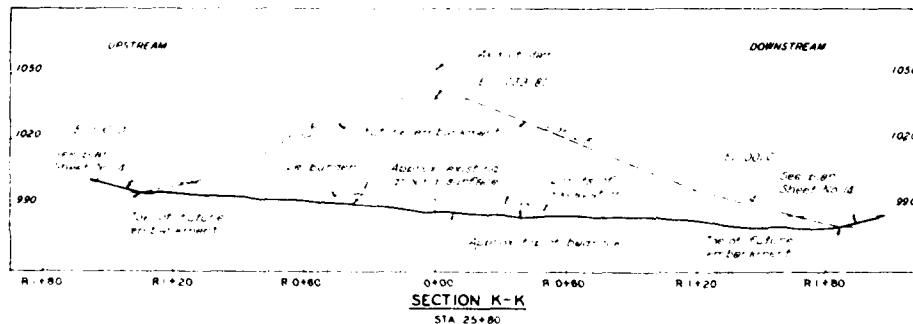
PROFILE OF OUTLET WORKS



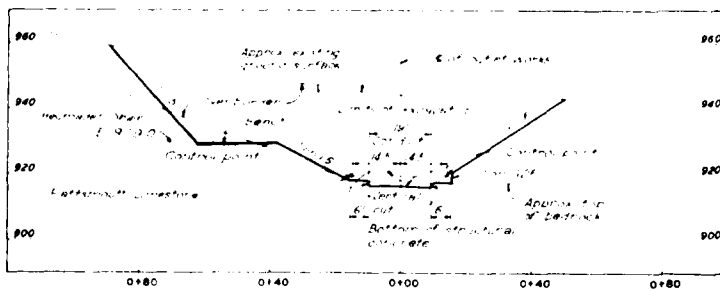




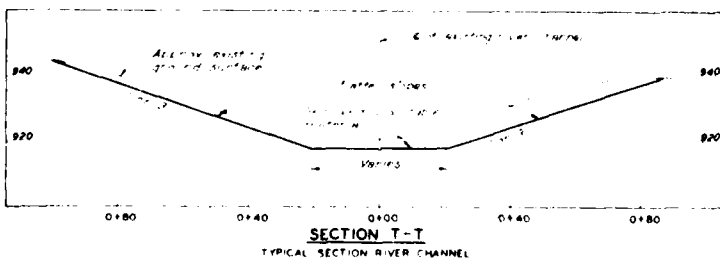
### 4. PROFILE OF OUTLET WORKS



SECTION K-K  
STA 25+80



SECTION 0-0  
STA 0+30 U OUTLET WORKS



SECTION T-T  
TYPICAL SECTION RIVER CHANNEL

NOTES  
For control point details  
see Sheet No. 1.  
For plan of right abutment and  
outlet works excavation see Sheet No. 4.  
For legend of underground  
explorations see Sheet No. 76.

**RECORD DRAWING**

MARCH 1967

CONTRACT NO DA 23 028 CIVENG 59 551



Spec. for: 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848,

DATE APP'D

HUNDRED AND TEN MILE CREEK KANSAS

## POMONA DAM

### STAGE I CONSTRUCTION

## OUTLET WORKS

### OUTLET WORKS EXCAVATION

In 80 sheets  
U S ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No 15

Scale as shown  
KANSAS CITY MO  
APRIL 1959

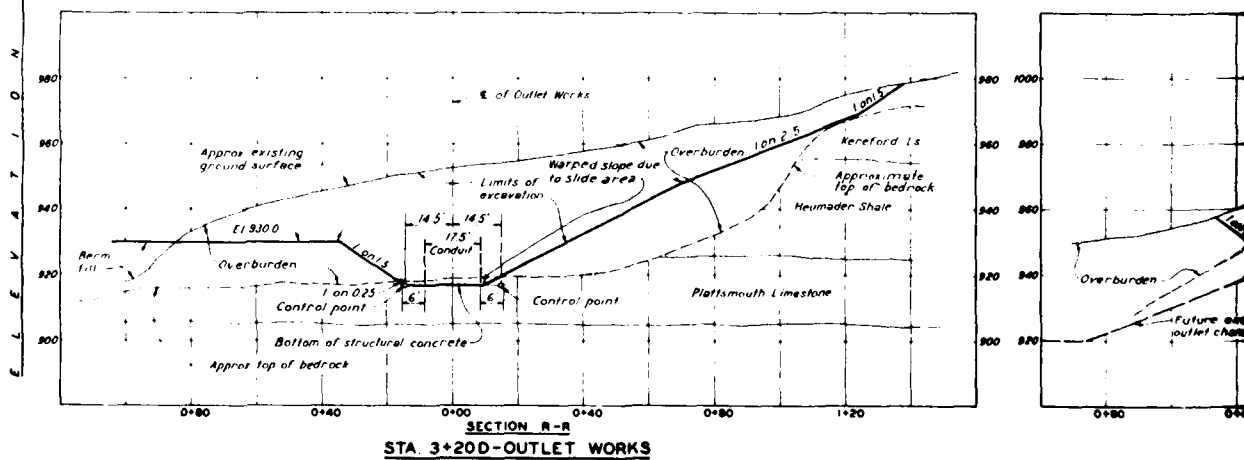
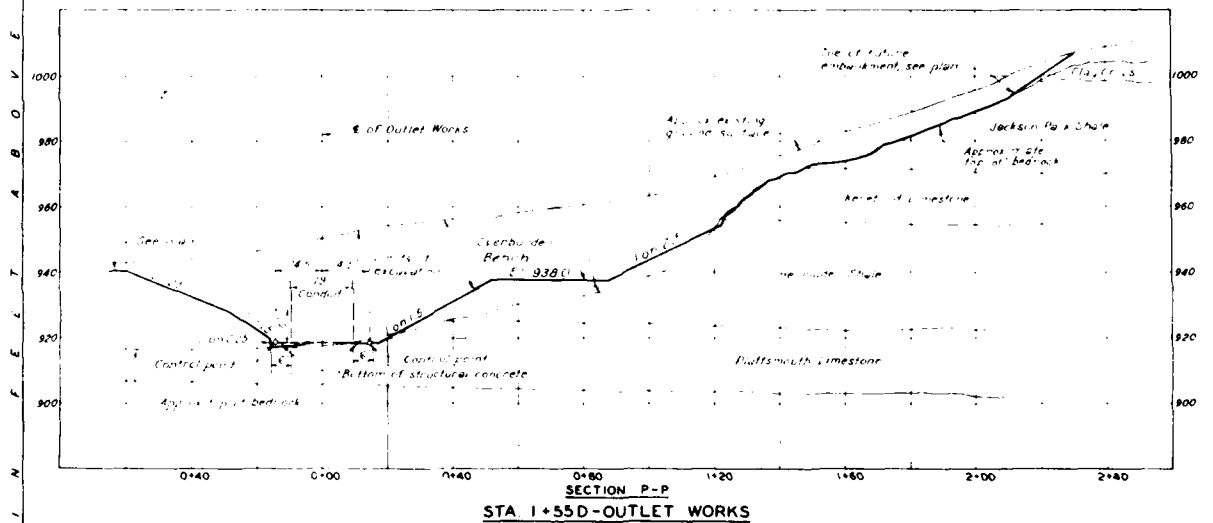
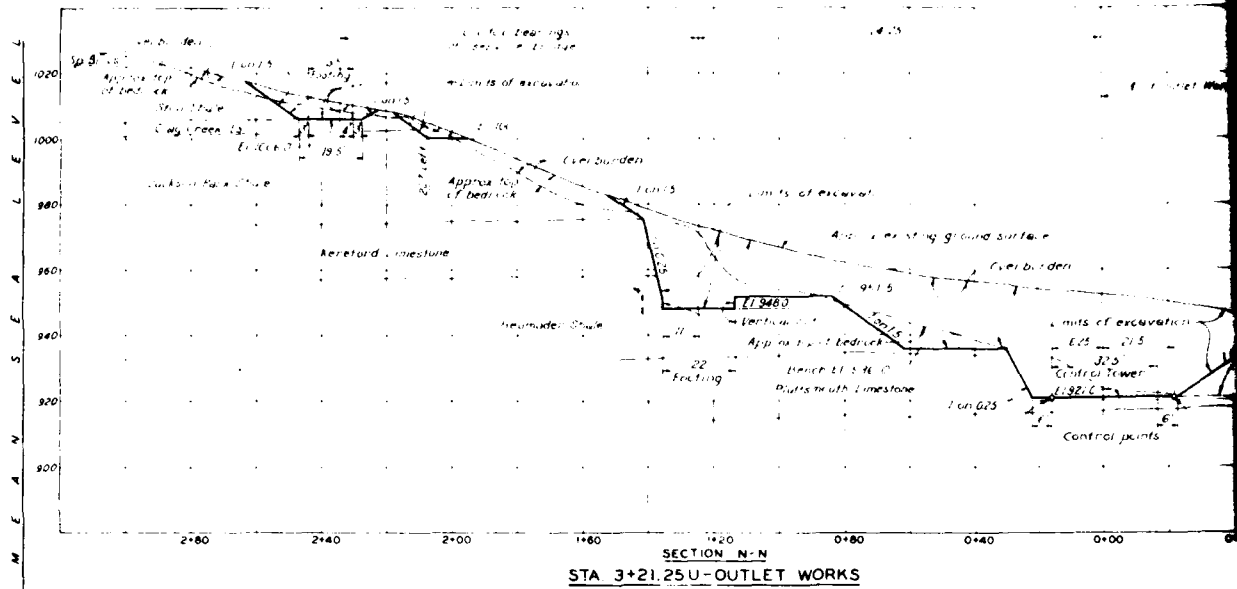
Submitted  
J. M. McEwen  
Chief, Earthwork Dist. Sec.  
Drawn by Traced by  
MOL REC

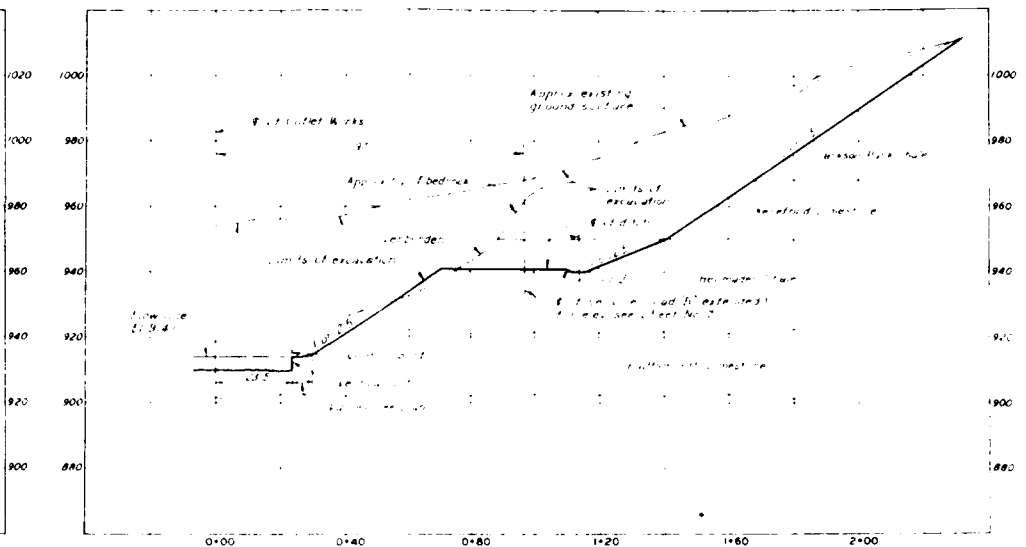
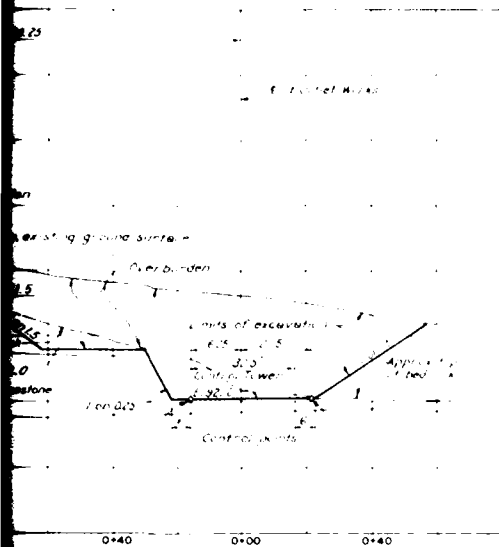
Recommended  
*James B. Gail*  
Chief, Engineering Division  
Checked by  
P.E.M.

Approved  
*[Signature]*  
 Col. C. E. District Engineer  
 File No  
 0-3-313

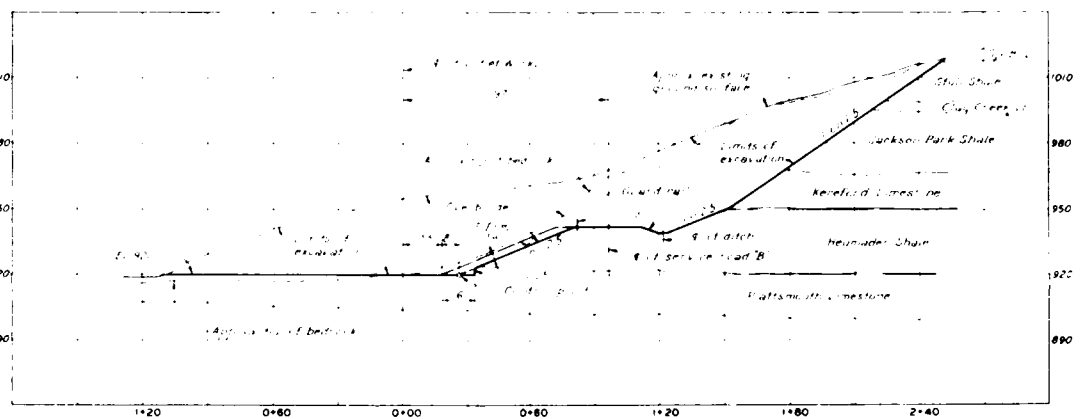
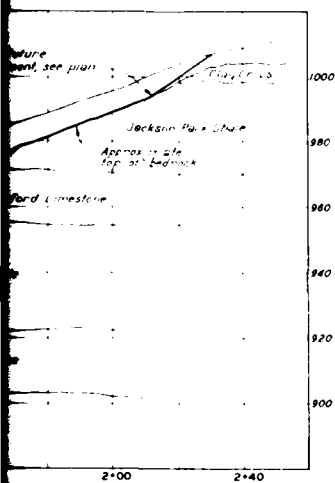
0-3-319

PLATE NO. 13

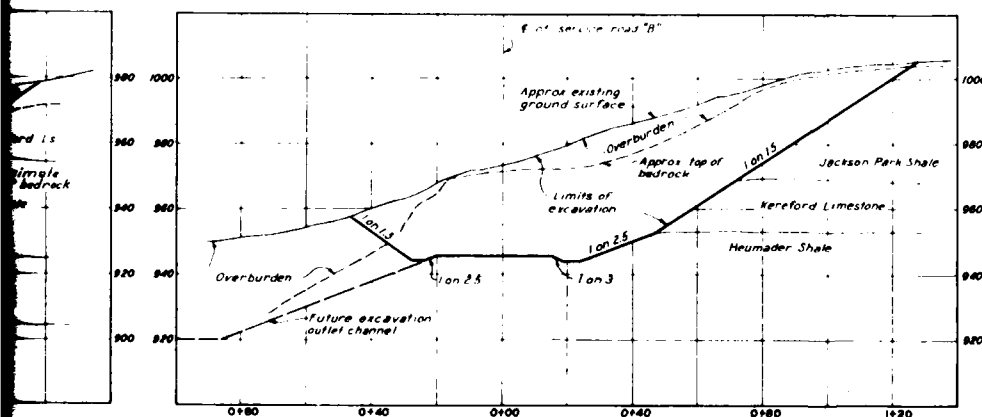




SECTION 5-S  
STA 4+90D-OUTLET WORKS



SECTION H-H  
STA 5+40D-OUTLET WORKS



SECTION I-I  
STA 0+00-SERVICE ROAD "B"

NOTE:  
For service road "B" alignment and grade see Sheet No. 1.  
For center point details see Sheet No. 1.  
For plan of outlet works excavation see Sheet No. 14.

## RECORD DRAWING

MARCH 1952  
CONTRACT NO. DA 23-028-ORVNS 59 551

SYN	DESCRIPTION	DATE	APP'D
	Revised for "As Built" conditions		
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS

### POMONA DAM

STAGE I CONSTRUCTION

OUTLET WORKS

EXCAVATION

SECTIONS

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 18

Scale as shown  
KANSAS CITY, MO  
APRIL 1950



Submitted  
J. M. M. Lamm  
Chief, Earthwork Dist. Sect.  
Drawn by  
HOL

Recommended  
R. B. Ford  
Chief, Engineering Division  
Checked by  
HES

Approved  
J. E. Lamm  
Col., C.E. District Engineer  
File No.  
O-3-518

PLATE NO 14

SECTION A-A

Scale 1"=20'

25'-0"

Flow

See Detail

#7 @ 12" each way

S=0.003

Crest E1 1008.0

S=0.005

5'-0"

3'-0"

8'-0"

2'-0"

3'-0"

1'-0"

10 anchors grouted in 6" holes

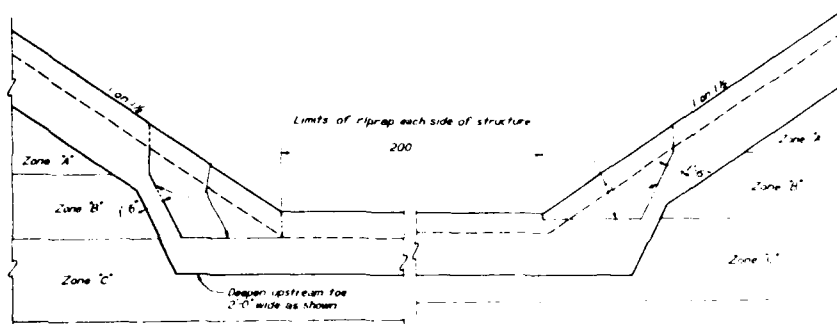
5 spaces @ 5'-45"0"

SECTION D-D

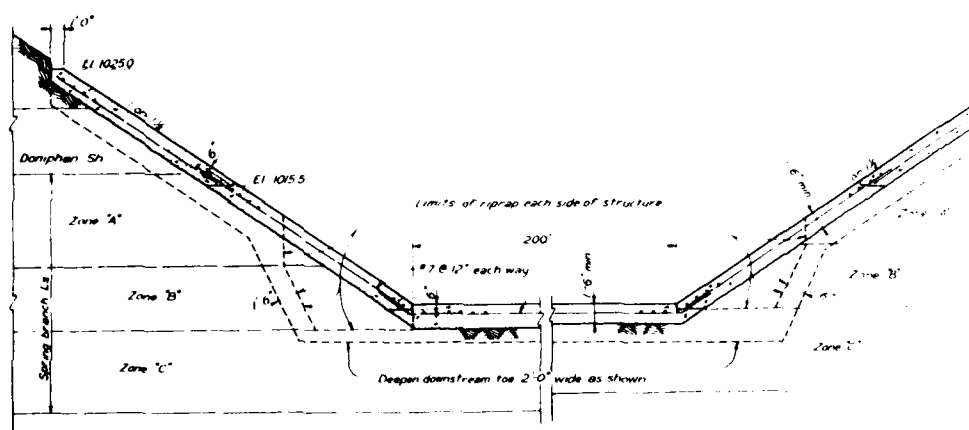
SECTION E-E (SIMILAR)

Scale 1/8"=1'-0"

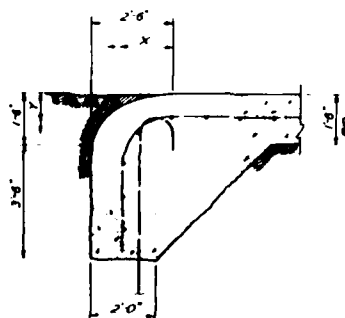
**(A) Note:**  
The thickened section at the upstream and downstream edge of the horizontal portion of the sill designed beyond the dimensions shown, as necessary to provide a minimum embedment below the top of the "C" zone of the Spring Branch Limestone of 3 feet 6 inches upstream and 1 foot 6 inches downstream.



**SECTION B-B**  
Scale  $\frac{1}{4}'' = 1' 0''$



**SECTION C-C**  
Scale 1/4" = 1' 0"



(A) DETAIL OF UPSTREAM TOE  
Scale 1/4" = 1' 0"

ORDINATES OF ELLIPTIC QUADRANT	
X	Y
1° 0'	1 1/2"
1° 6'	3 3/4"
2° 0'	7 1/4"
2° 6'	11 5/8"

NOTE  
C. J. indicates construction joints with  
steel reinforcement continuous through  
joints

## RECORD DRAWING

MARCH 1962  
CONTRACT NO DA-23-028-CRENG 99 551

(A) SYM	<i>Revised for "As Built" conditions</i>	DESCRIPTION	REVISIONS

DATE 12/2/84 APP'D [Signature]

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

### STAGE I CONSTRUCTION

## SPILLWAY

**CONTROL SILL**

## CONCRETE AND REINFORCEMENT

In 80 sheets Sheet No 66  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Scale as shown  
KANSAS CITY, MO.  
APRIL 1950

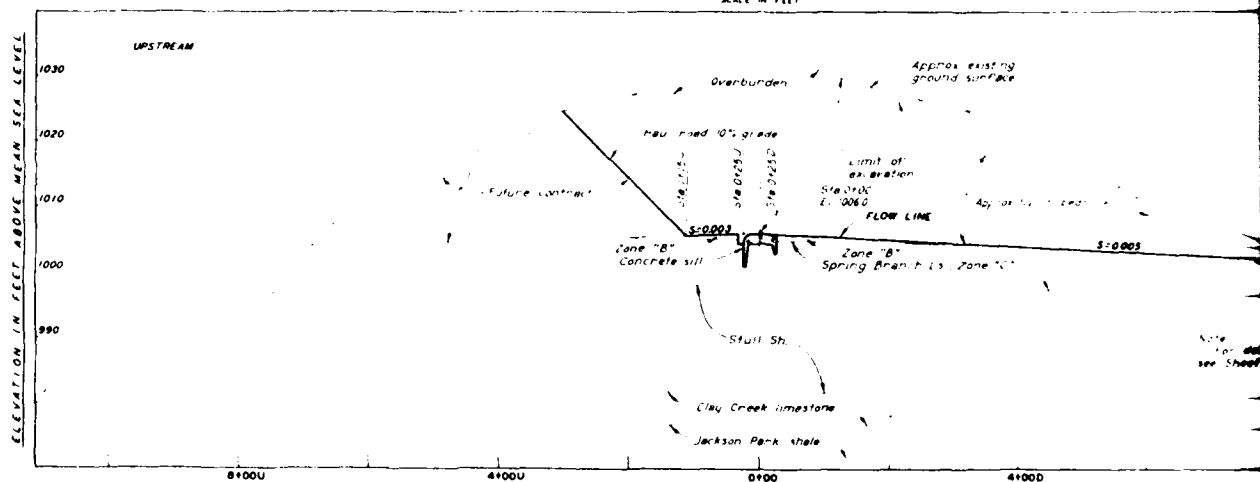
**Note**  
Coat elliptic surface with concrete curing compound to eliminate bond

Submitted <i>[Signature]</i> Dist. Structures Design	Recommended <i>[Signature]</i> Chief Engineering Division
Drawn by P. T. L.	Checked by E. B. C.
Traced by D. O. L.	

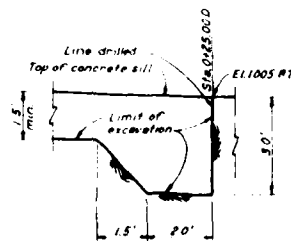
Approved  
*X E. E. Harrison*  
 C. E. District Engineer  
 Feb 196  
 C-3-200

PLATE NO. 15

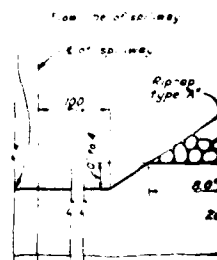
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SCALE IN FEET



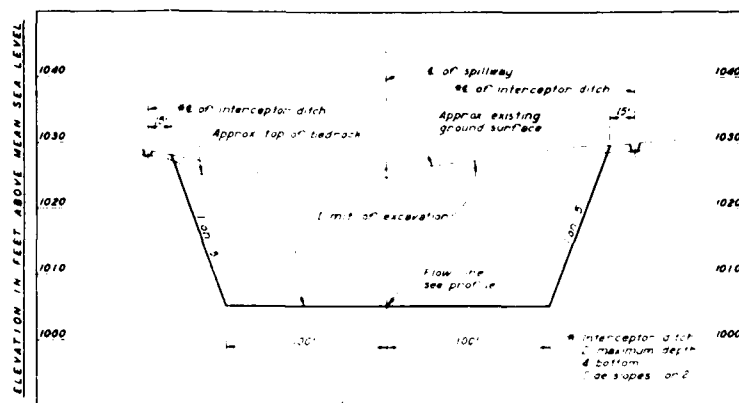
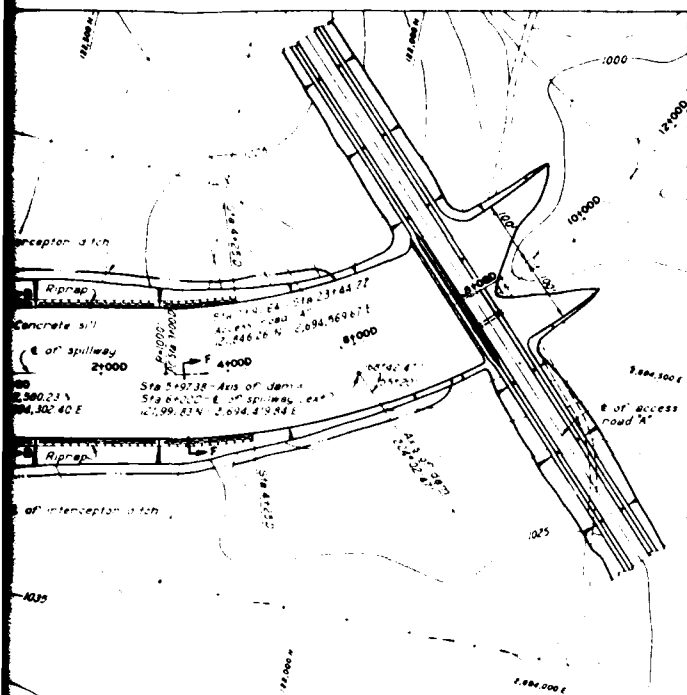
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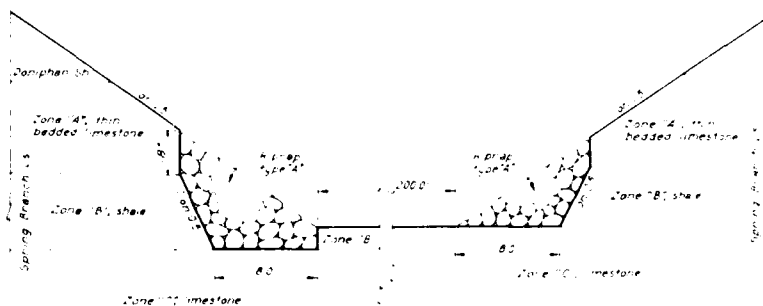
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Plan

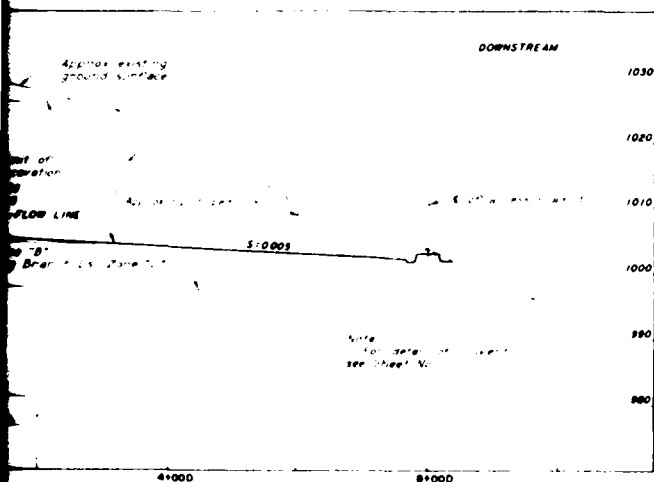


SECTION A-A



SECTION B-B

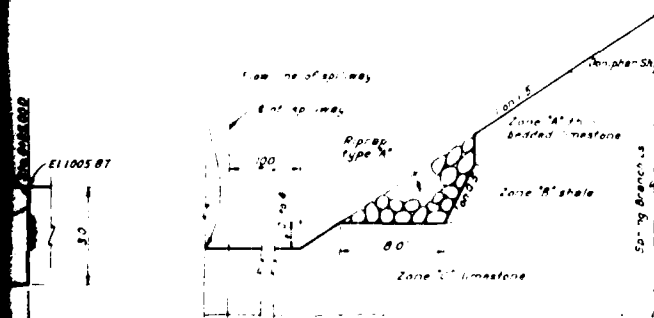
Not to scale



SECTION C-C

Not to scale

SPILLWAY



SECTION F-F

Not to scale

## NOTES

For excavation data is adjacent to concrete structure, see Sheet No. 66.  
For access road alignment and grade, see Sheet No. 66.  
The 5 foot vertical surface upstream and the 3 foot vertical surface downstream were fine filled.

## RECORD DRAWING

MARCH 1967

CONTRACT NO. DA 23-028-CIVENG 59 951

SYM

Revised for As-Built conditions

DESCRIPTION

REVISIONS

DATE APP'D

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

STAGE I CONSTRUCTION

SPILLWAY

EXCAVATION

PLAN, PROFILE AND SECTIONS

In 80 sheets

Sheet No. 67

U.S. ARMY ENGINEER DISTRICT

Scale as shown

KANSAS CITY

KANSAS CITY, MO

Submitted

Recommended

Approved

Chief, Earthwork Dist Sect

Chief, Engineering Division

Col. C. E. Bicknell, Engineer

HDL

GBW

PEM

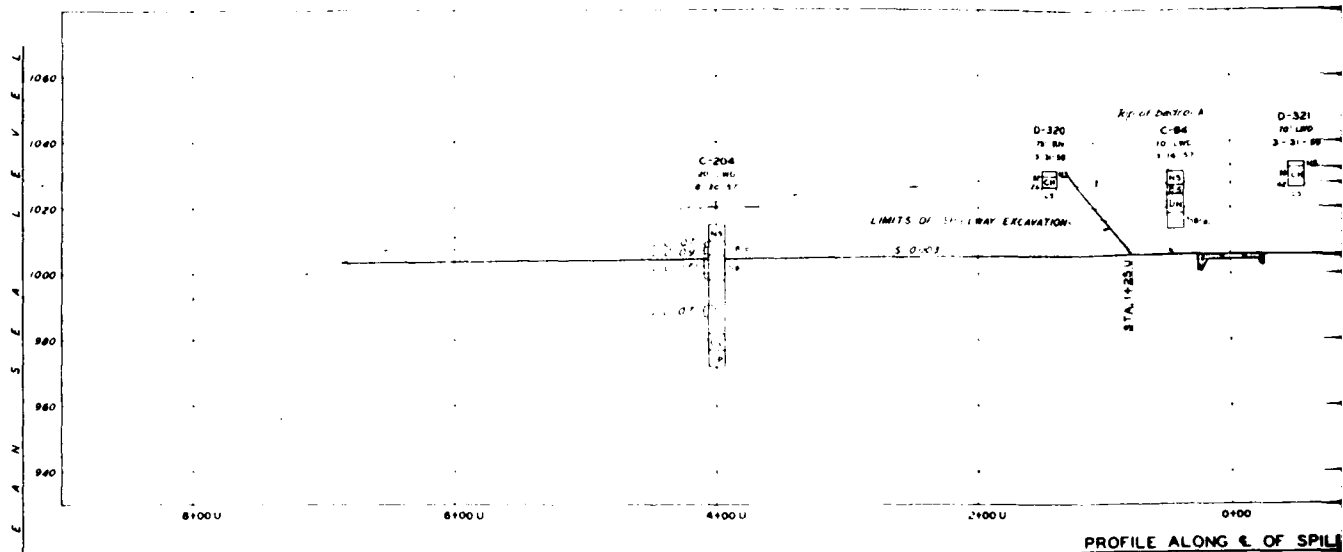
File No.

O-3-387

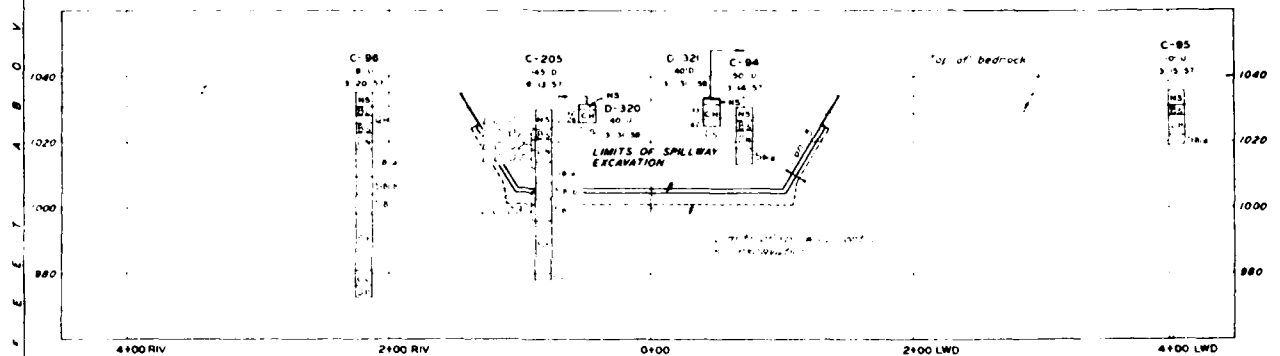




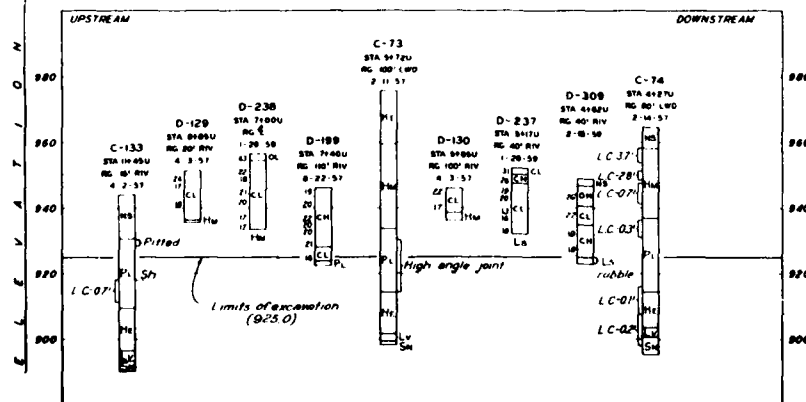




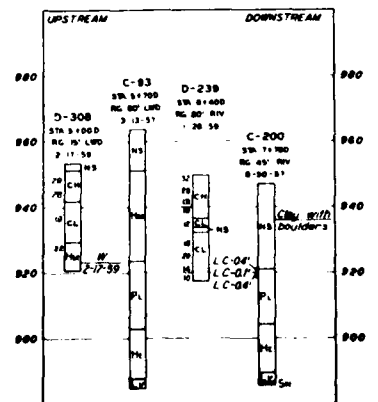
PROFILE ALONG C. OF SPILL



SECTION-STA 0+00

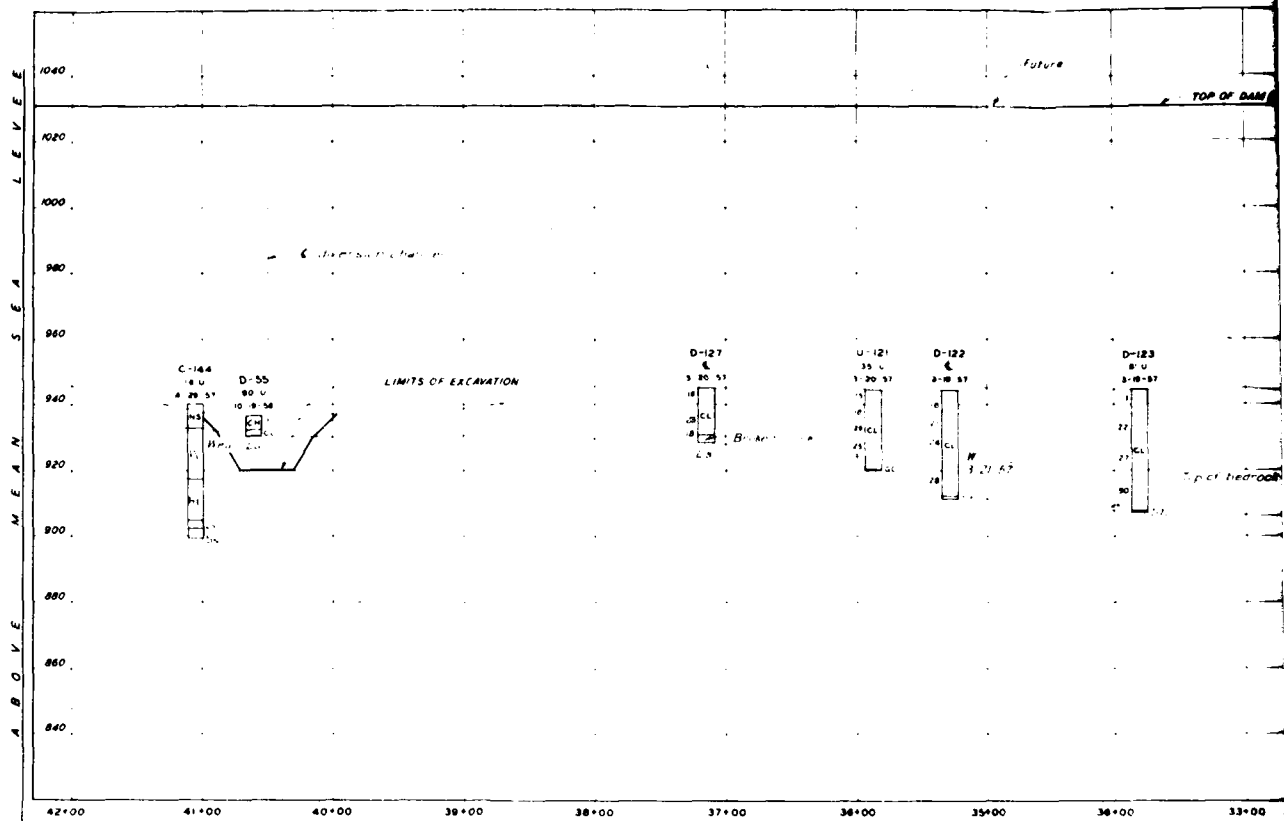


APPROACH CHANNEL-OUTLET WORKS

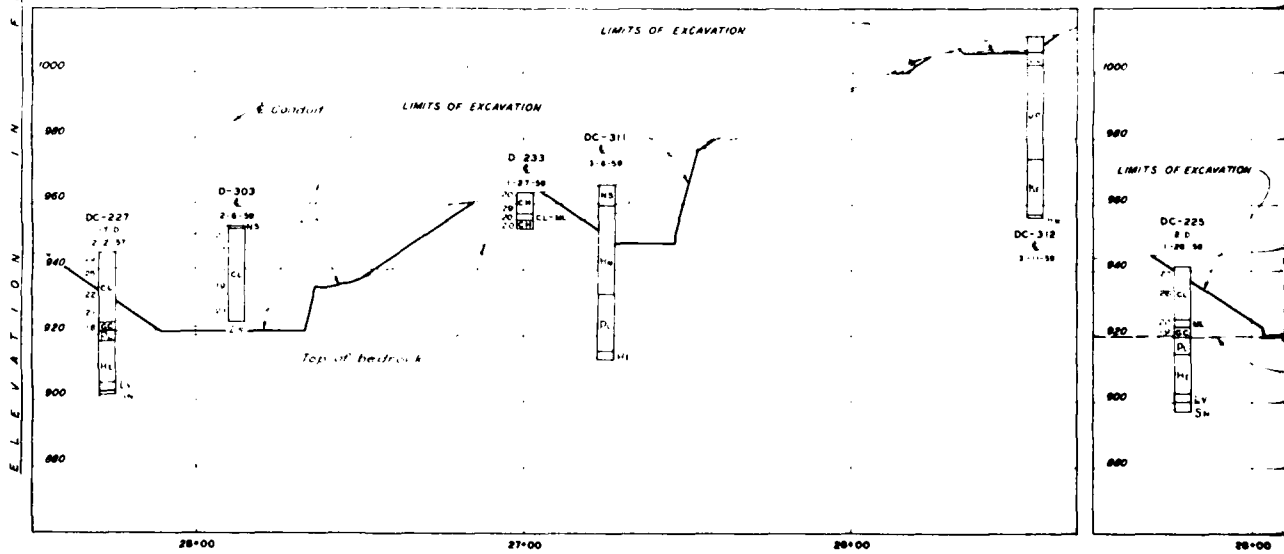


OUTLET CHANNEL-OUTLET WORKS



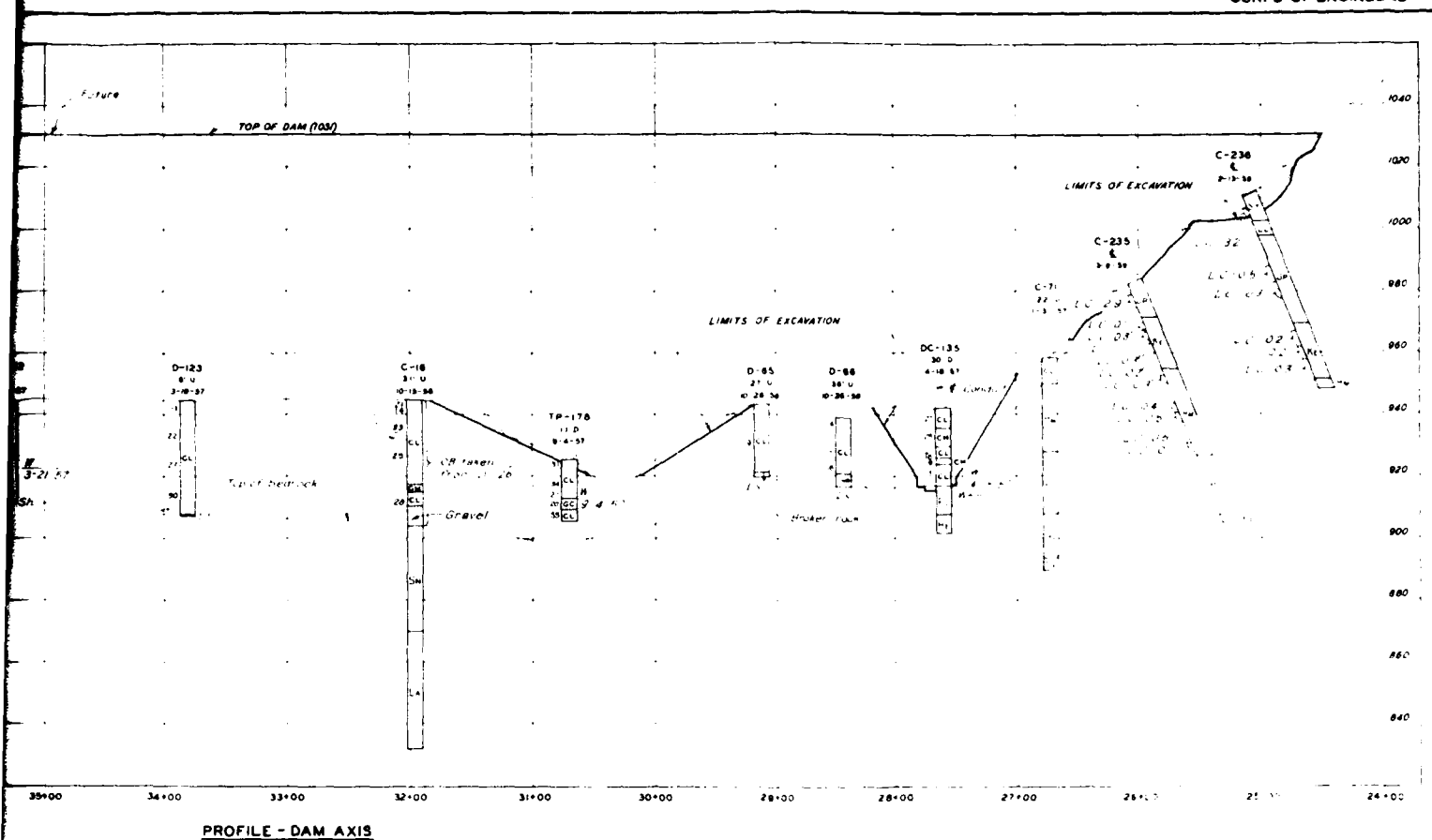


PROFILE - DAM

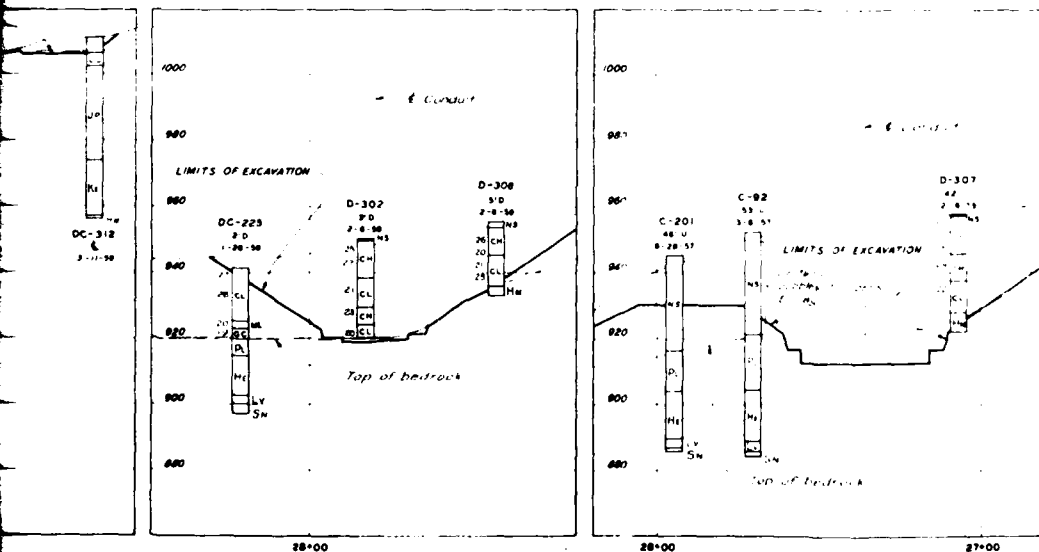


OUTLET WORKS SECTION - STATION 3+21.25 U

OUTLET WORKS SECTION



PROFILE - DAM AXIS



OUTLET WORKS SECTION - STATION 2+00 U

OUTLET WORKS SECTION - STATION 4+00 D

NOTES  
1. See Notes 1 through 4  
2. See Notes 1 through 4  
3. See Notes 1 through 4  
4. See Notes 1 through 4

## RECORD DRAWING

MARCH 1960  
CONTRACT NO. DA 23-028 (CHENG 58) 1

Revised for As Built conditions  
DESCRIPTION  
REVISIONS

DATE APP'D

HUNDRED AND TEN MILE CREEK, KAN.

## POMONA DAM

STAGE 1 CONSTRUCTION

LOGS OF UNDERGROUND EXPLORATION  
AXIS OF DAM AND OUTLET WORKS

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 77

Scale as shown  
KANSAS CITY, MO  
APRIL 1959

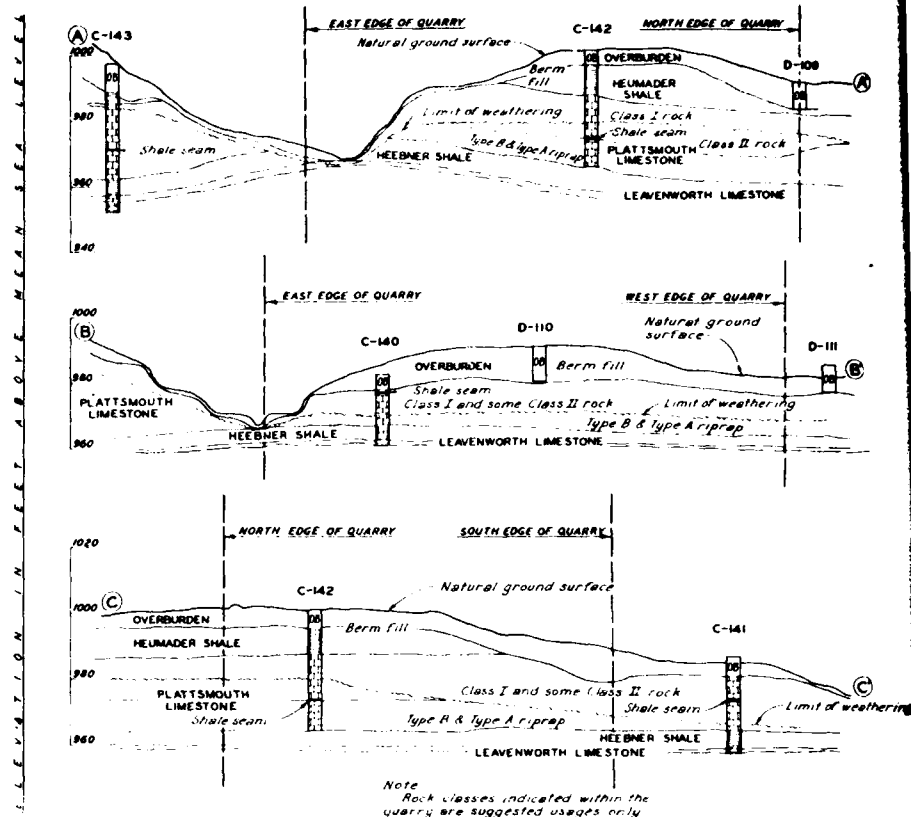
Submitted by  
Checked by  
Drawn by  
NRL

Recommended by  
Checked by  
Drawn by  
DES

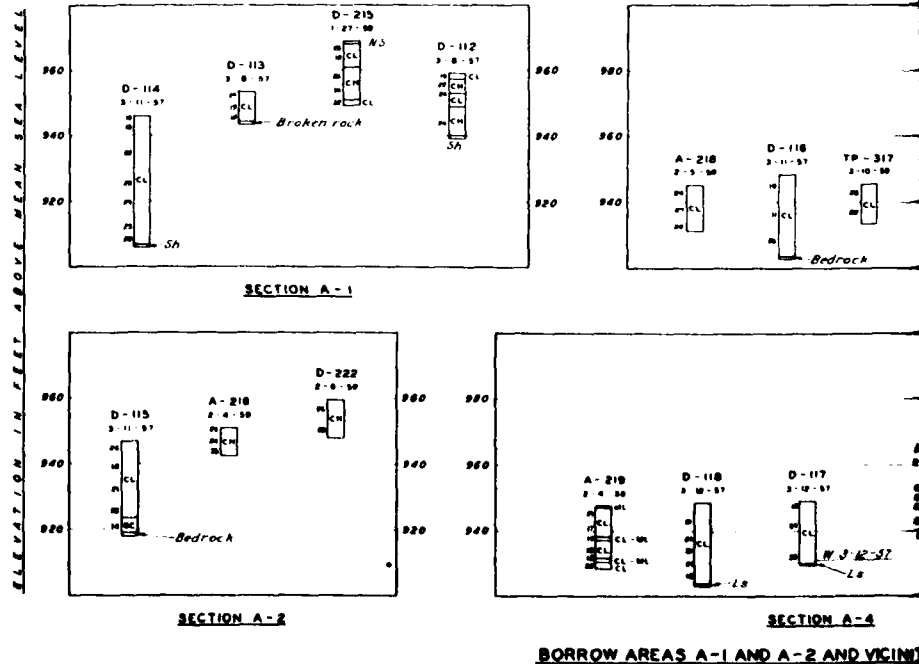
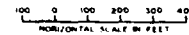
Approved by  
Checked by  
Drawn by  
CRG

0-3-377

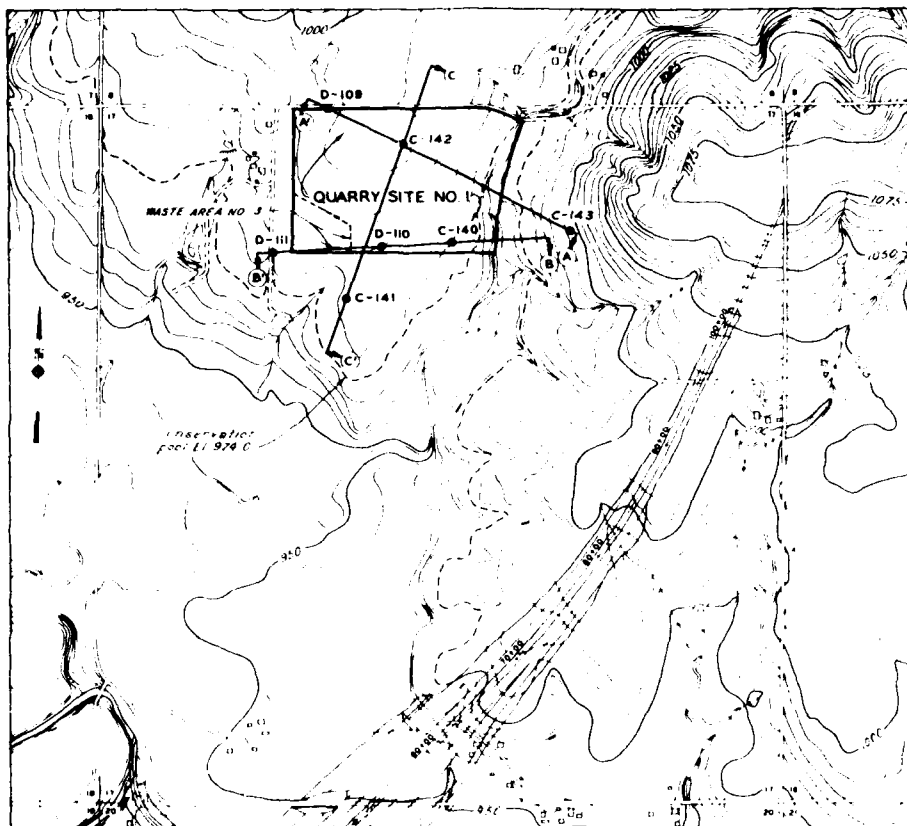
PLATE NO. 19



UNDERGROUND EXPLORATIONS

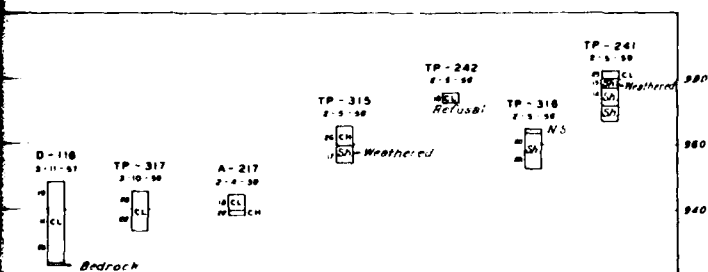


BORROW AREAS A-1 AND A-2 AND VICINITY

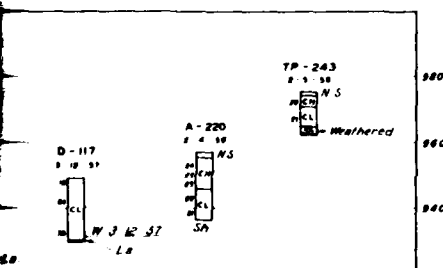


PLAN  
500 0 500 1000 1500  
SCALE IN FEET

QUARRY SITE NO. 1



SECTION A-3



SECTION A-4

AND A-2 AND VICINITY

## RECORD DRAWING

MARCH 1962  
CONTRACT NO. DA 23-028-GENVIG 59 551



Revised for "As Built" conditions  
DESCRIPTION  
REVISIONS

DATE APPD

HUNDRED AND TEN MILE CREEK KANSAS

## POMONA DAM

STAGE I CONSTRUCTION

LOGS OF UNDERGROUND EXPLORATIONS  
QUARRY SITE AND BORROW AREA "X"

In 80 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 78

Scale as shown  
KANSAS CITY MO  
APRIL 1966

Submitted  
Chief, Geology Section  
Drawn by  
V.L.A.

Recommended  
Chief, Engineering Division  
Checked by  
F.E.G.

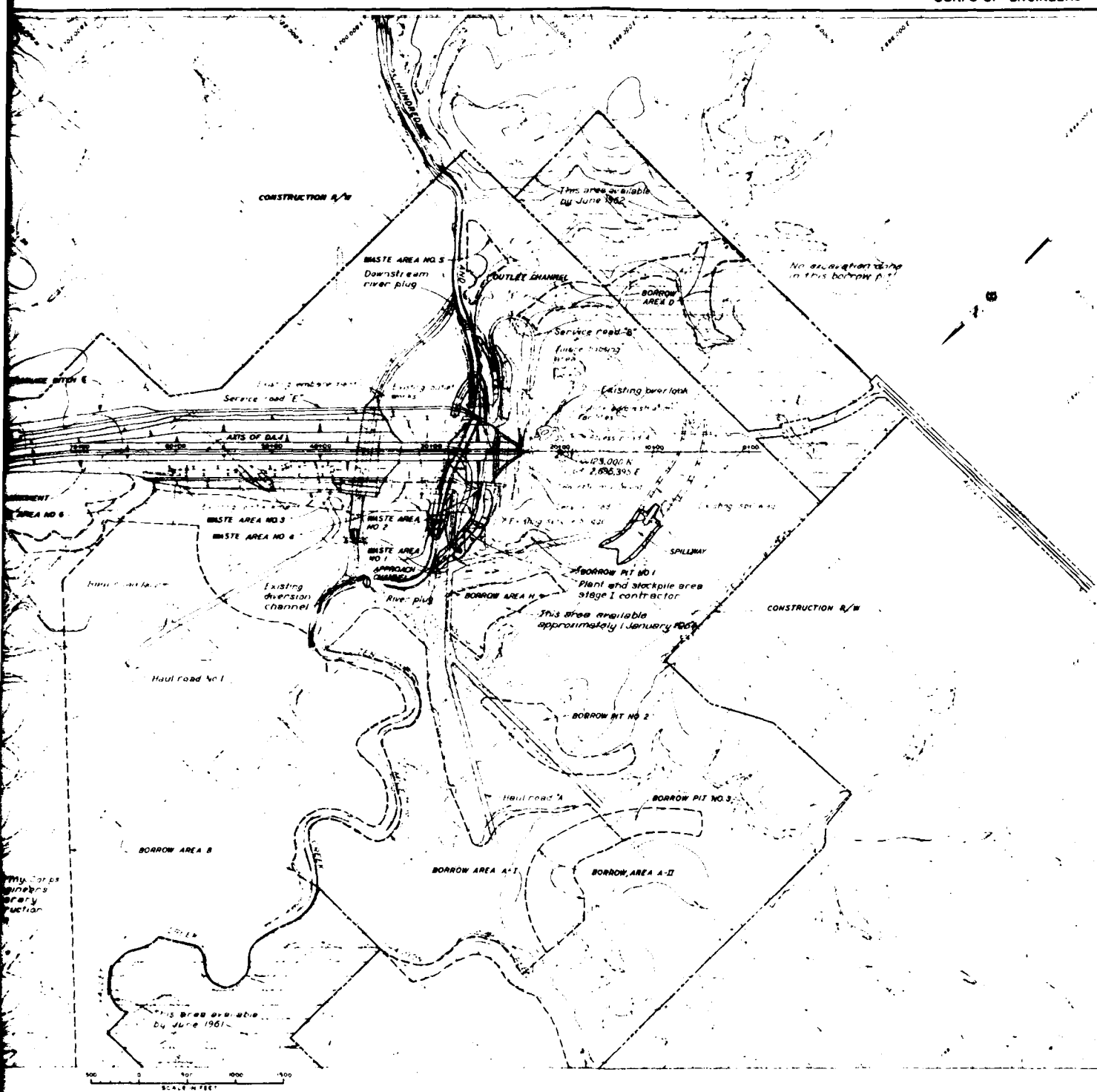
Approved  
Chief, District Engineer  
P.D. No.  
C.R.G.



PLATE NO. 20







HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

### COMPLETION OF EMBANKMENT

# RECORD DRAWING

OCTOBER 1963

CONTRACT NO DA-23-028-CYFNG-41 280



(A) SYM	Wavelength As Built conditions	DESCRIPTION	REVISIONS
------------	--------------------------------	-------------	-----------

In 29 sheets  
U S ARMY ENGINEER DISTRICT  
KANSAS CITY

**Sheet No. 2**

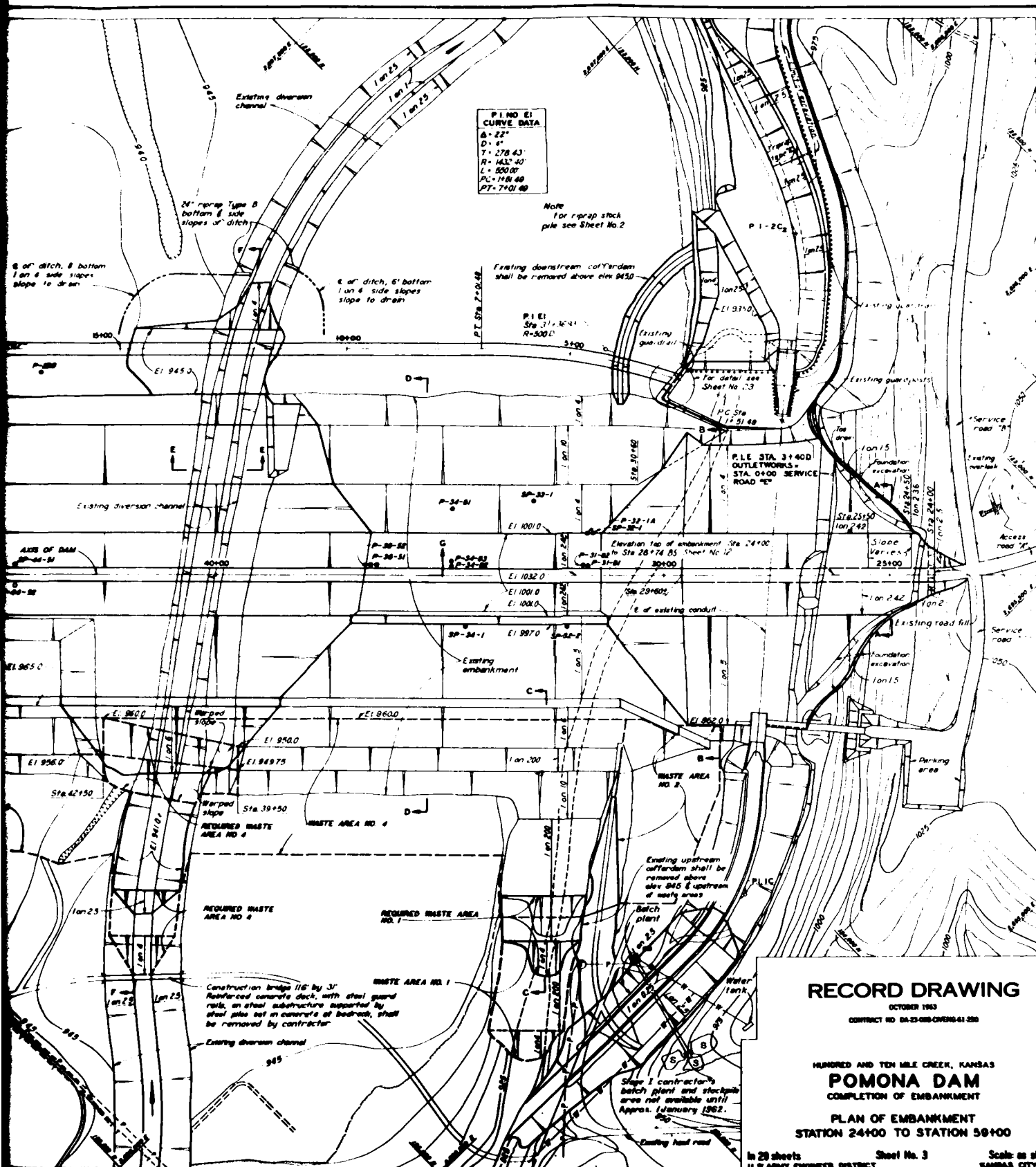
Scale: as shown  
KANSAS CITY, MO.  
SEPTEMBER 1960

Submitted  
*E. J. Sullivan*  
 Chief, Docs & Film Sec.  
 Drawn by Traced by  
 NFP J.A.W.

Recommended  
Chief, Engineering Division  
Checked by  
RGF

Approved  
*E. E. Harrison*  
Col. C.E., District Engineer  
File No  
0-3 4472





## RECORD DRAWING

OCTOBER 1963  
CONTRACT NO DA-23-000-ORD-41-220

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

### COMPLETION OF EMBANKMENT

**PLAN OF EMBANKMENT  
STATION 24+00 TO STATION 59+00**

In 20 sheets  
U. S. ARMY ENGINEER DISTRICT  
SACRAMENTO CITY

Sheet No. 3

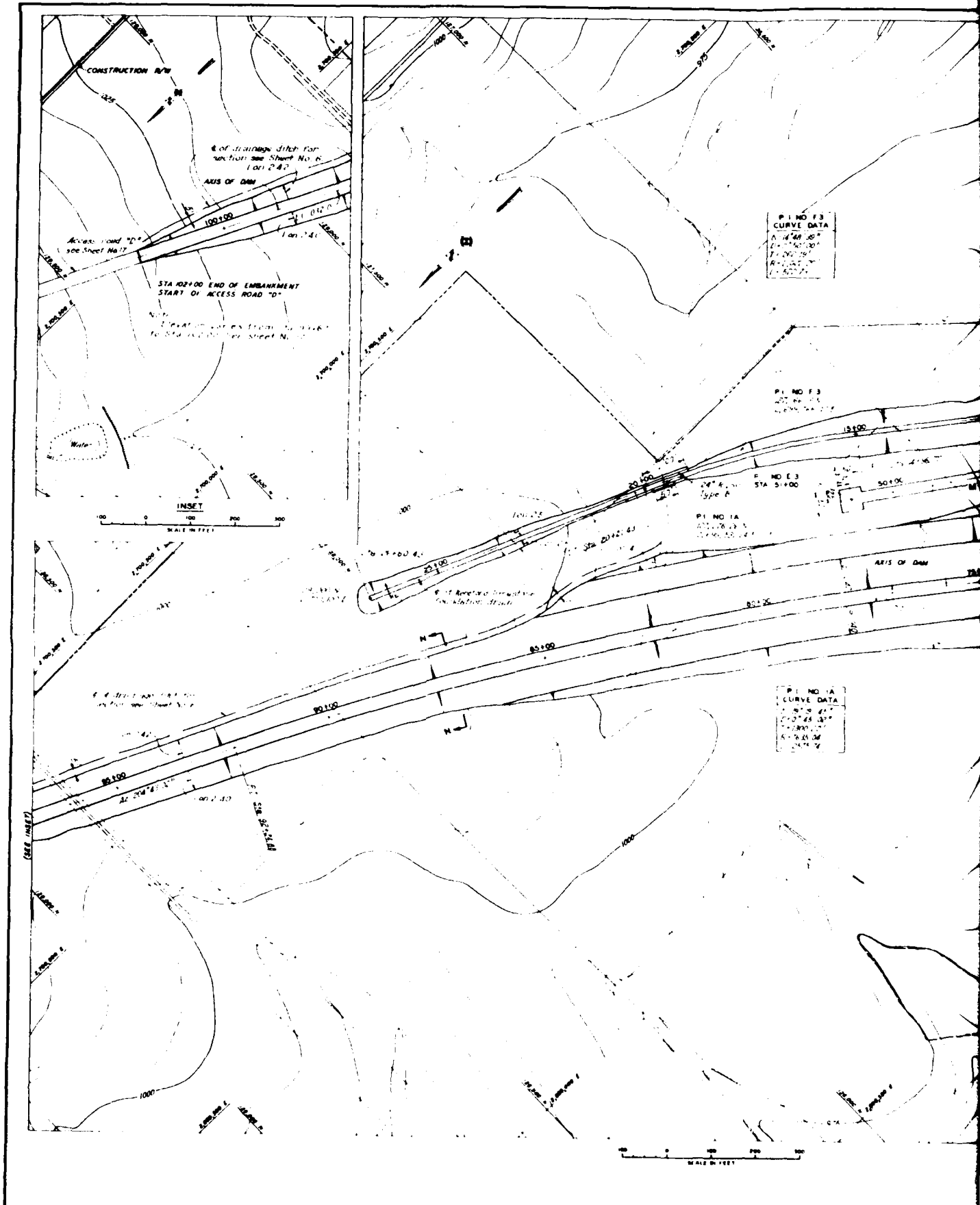
Scale: as shown  
KANSAS CITY, MO.  
SEPTEMBER 1990

Submitted: E. J. [Signature]  
 Chief, Bureau of Police, State  
 Drawn by: H. F. R. Traced by: G. B. W.

Recommended  
 \_\_\_\_\_  
 Chief, Engineering Division  
 Checked by:  
 A.C.F.

Approved  
*[Signature]*  
 Col. C.E. Star of Superior  
 File No.  
 9-3-473

PLATE NO. 22



## OCTOBER 1963

CONTRACT NO. DA-23-028 CIVE NG 61 240

A	Revised for "As Built" conditions
SYM	DESCRIPTION REVISIONS

DATE APP'D \_\_\_\_\_

HUNDRED AND TEN MILE CREEK, KANSAS,  
**POMONA DAM**  
COMPLETION OF EMBANKMENT

PLAN OF EMBANKMENT  
STATION 59+00 TO STATION 102+00

In 29 sheets  
U.S. ARMY EN  
KANSAS CITY

Sheet No 4

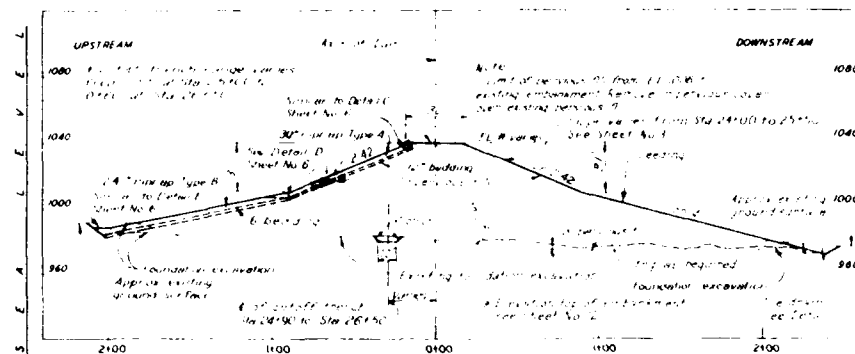
Scale as shown  
KANSAS CITY, MO  
SEPTEMBER 1960

Submitted  
E. L. Johnson  
Chief, News & Film Sec.  
Drawn by Traced by  
NFP REC

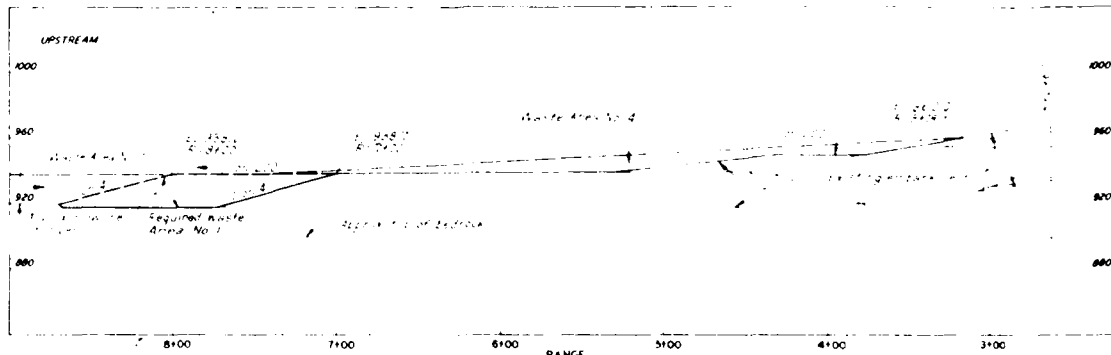
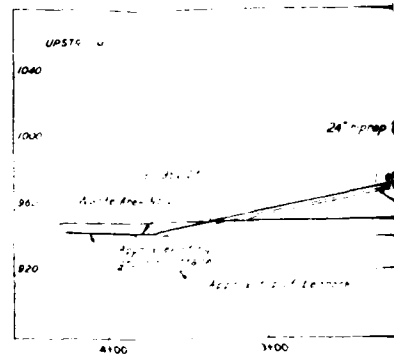
File independent,  
 Chief, Engineering Division  
 (checked by  
 R.G.F.)

Approved  
*[Signature]*  
 Col. C. E. District Engineer  
 File No.  
 0-3-47

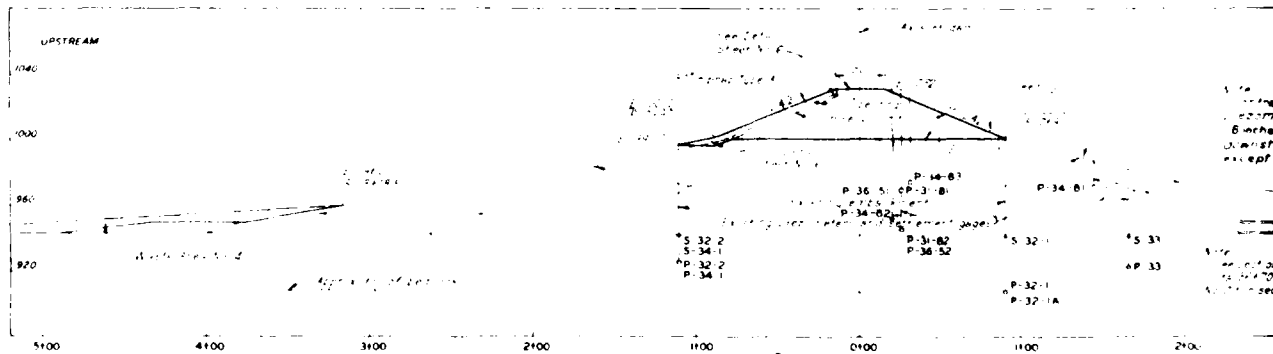
0-3-47



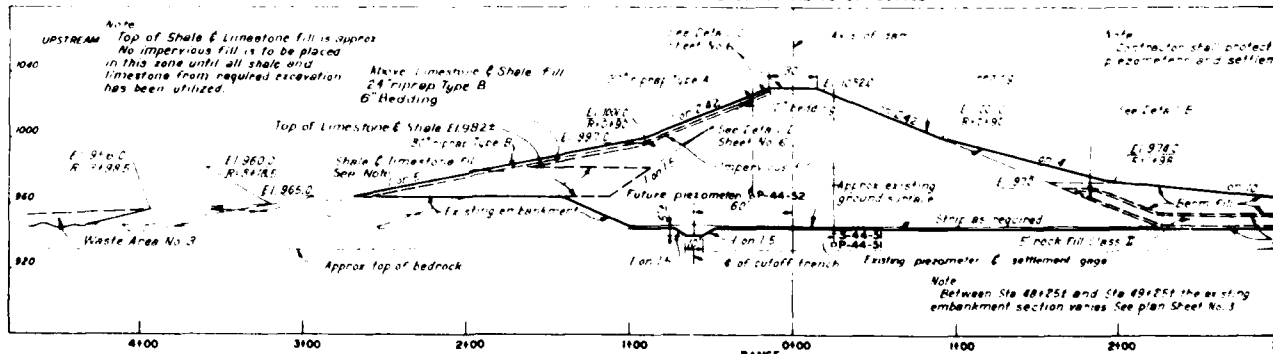
SECTION A-A  
TYPICAL STA. 24+00 TO STA. 26+00



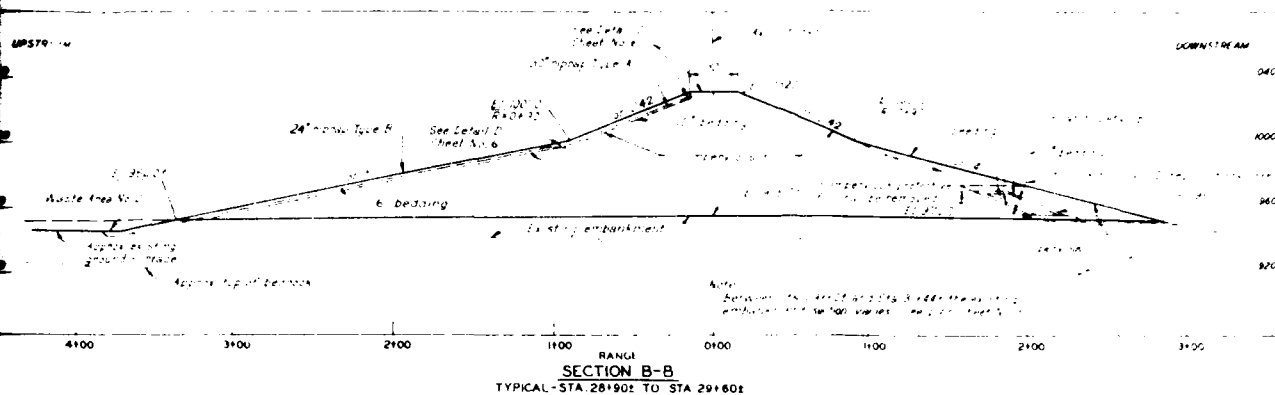
SECTION C-C  
STA. 32+30 UPSTREAM CHANNEL FILL



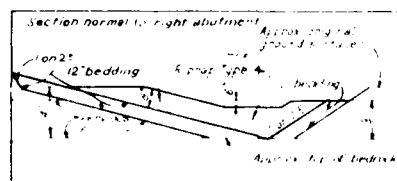
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TYPICAL STA. 31+44.2 TO STA. 38+70.2



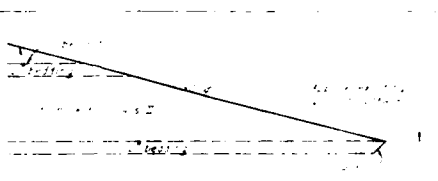
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TYPICAL STA. 43+50.2 TO STA. 48+25.2



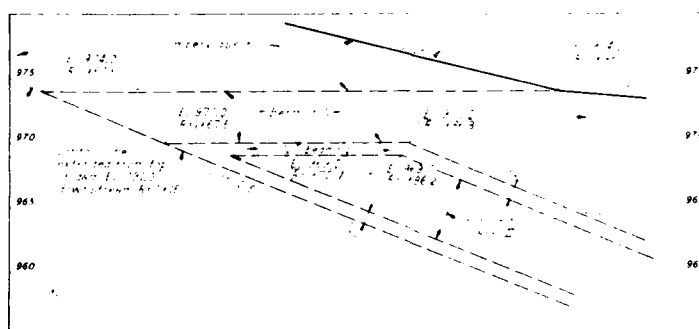
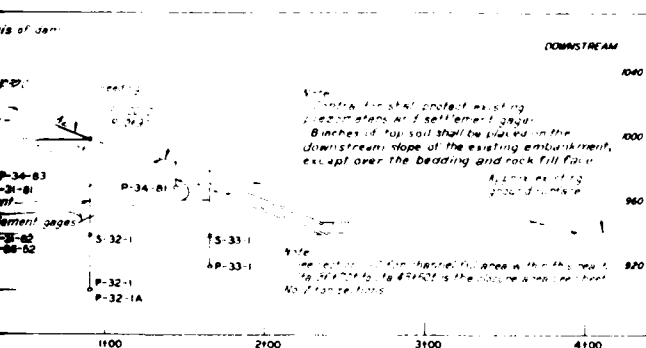
SECTION B-8  
TYPICAL - STA. 28+90± TO STA 29+60±



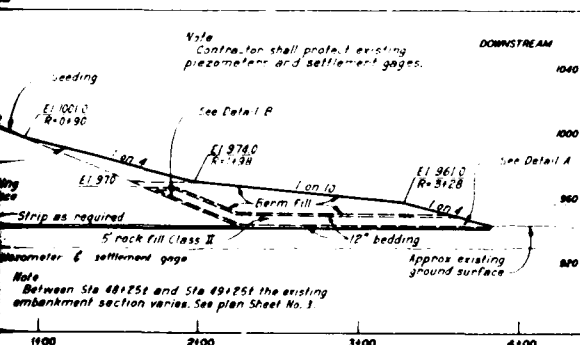
### DETAIL OF TOE DRAIN



DETAIL A



DETAIL B



NOTE  
The complete downy-mildew is present in seeds with the exception of the following and each of the Class II fungi.

## RECORD DRAWING

OCTOBER 1963  
CONTRACT NO. DA 23-028-CNENG-61-250

②	Revised for As Built conditions	5764	EW
SYM	DESCRIPTION	DATE	APP'D
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS

## POMONA DAM

EMBANKMENT SECTIONS  
STATION 24+00 TO STATION 49+25±

In 29 sheets Sheet No. 5  
U S ARMY ENGINEER DISTRICT  
KANSAS CITY

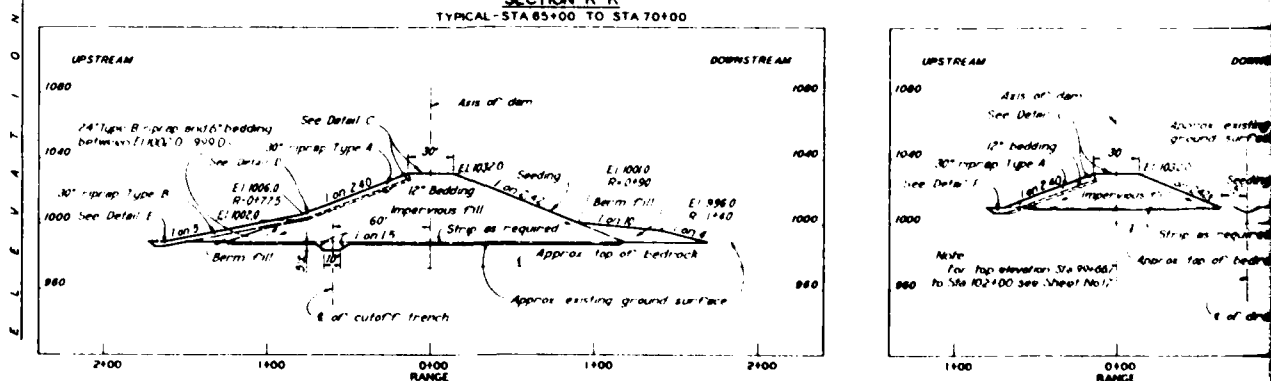
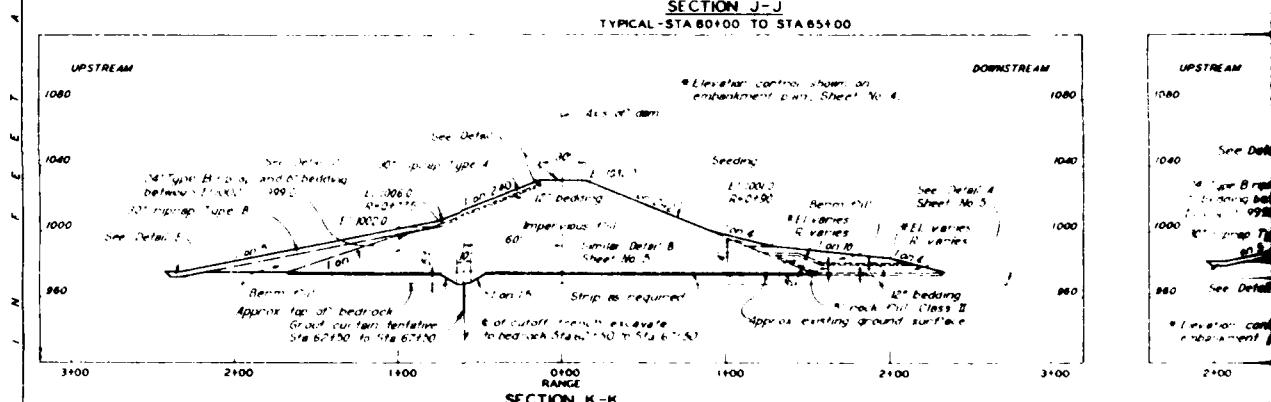
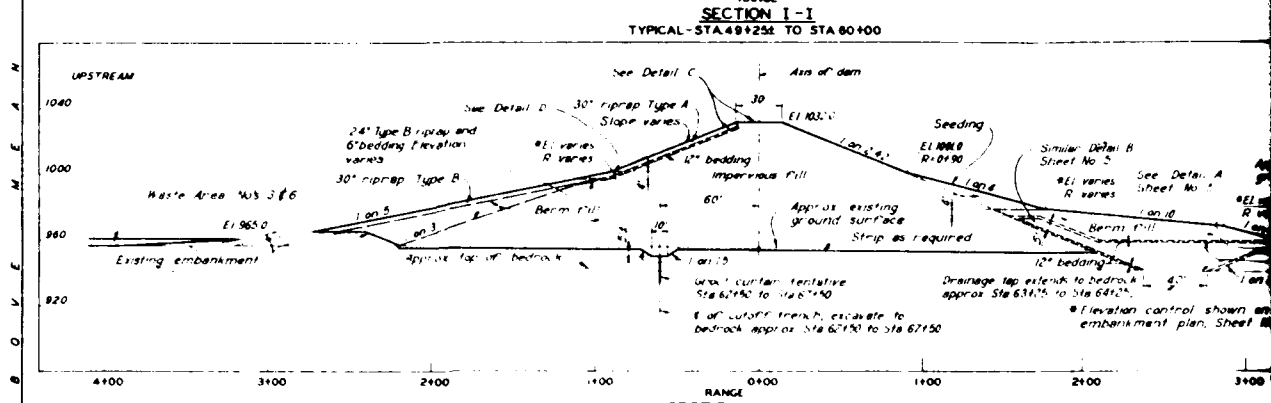
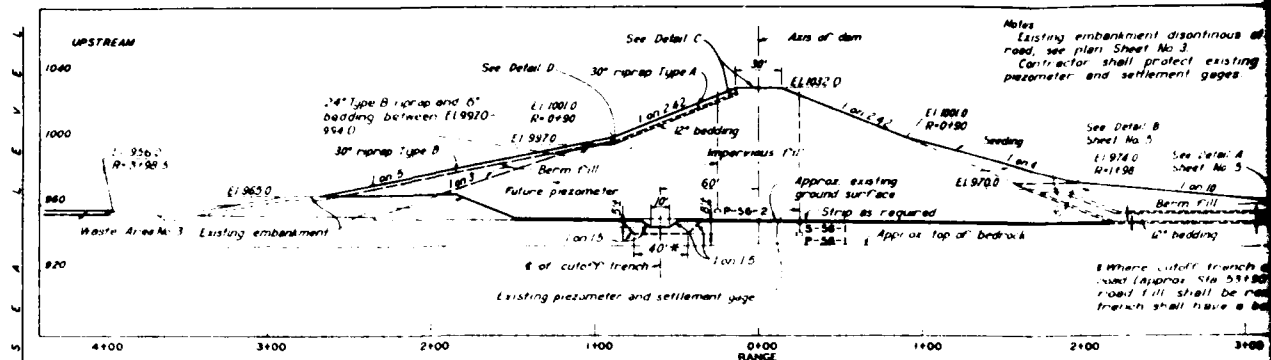
Scale as shown  
KANSAS CITY, MO  
SEPTEMBER 1960

Submitted by E. J. Rosten  
 Chief, Data & Film Sec.  
 Drawn by \_\_\_\_\_ Traced by \_\_\_\_\_  
 H.F.P. G.R.B.

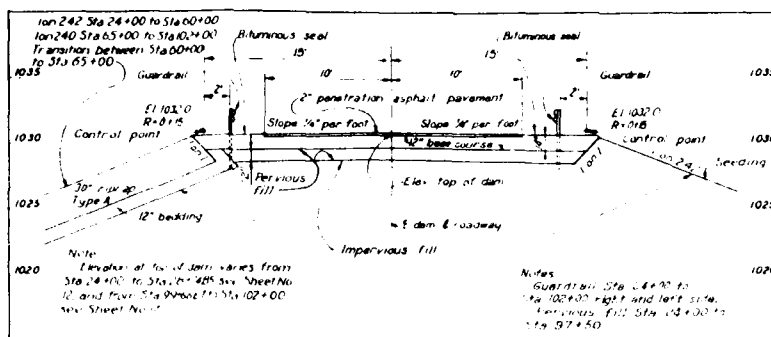
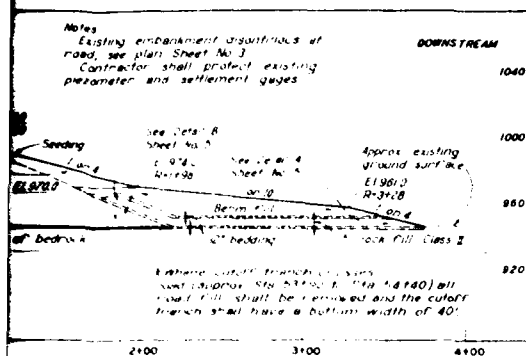
Recommended  
*[Signature]*  
 Chief, Engineering Division  
 Checked by  
 R.G.F.

Approved  
*C. E. Johnson*  
Col., C. E., District Engineer  
File No  
0-3-47

PLATE NO 24



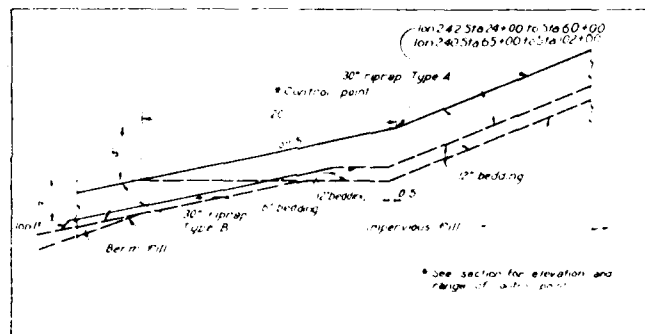
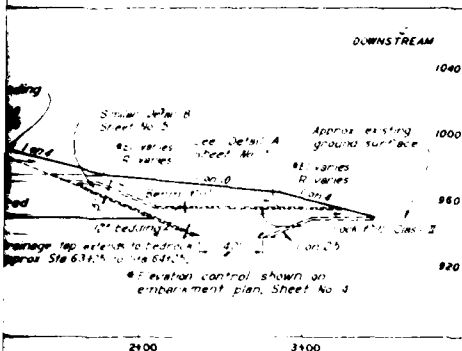




DETAIL C-TYPICAL SURFACING-TOP OF DAM

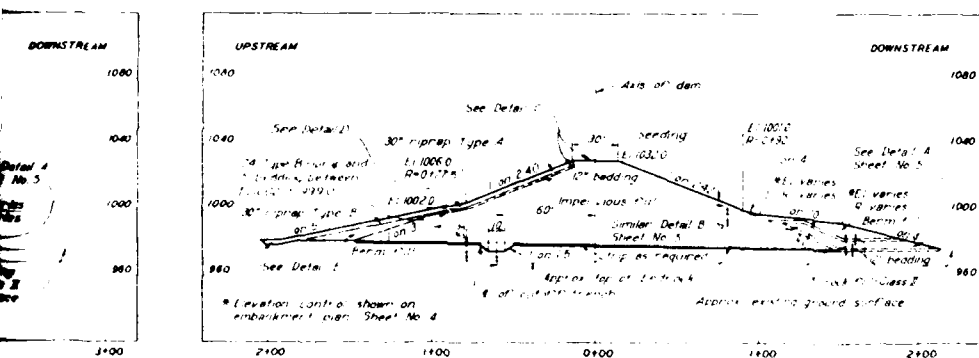
STA 24+00 TO STA 102+00

Scale 1"=5'



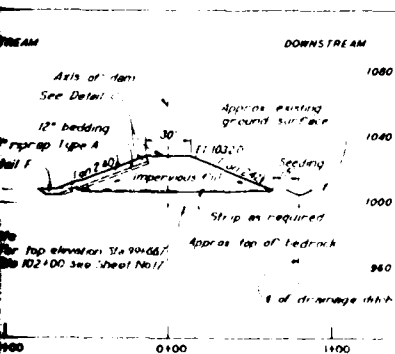
DETAIL D

Scale 1"=5'



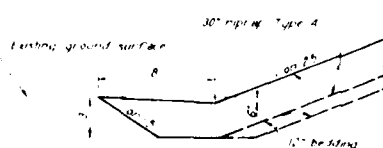
SECTION L-L

TYPICAL-STA 70+00 TO STA 74+00



SECTION N-N

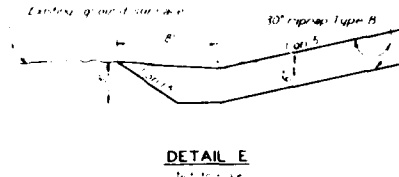
TYPICAL-STA 85+00 TO STA 102+00



DETAIL F

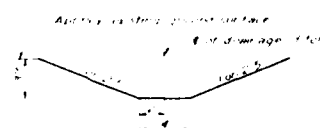
Not to scale

NOTE:  
The complete downstream slope shall be graded with the exception of the bedding and rock fill Class II face.



DETAIL E

Not to scale



SECTION-DRAINAGE DITCH

Scale 1"=5'

## RECORD DRAWING

OCTOBER 1963

CONTRACT NO. DA 21-028 COVER 41-750

Revised for 1st B.L. conditions  
DESCRIPTION  
REVISIONS

DATE  
APP'D

HUNDRED AND TEN MILE CREEK, KANSAS

POMONA DAM

COMPLETION OF EMBANKMENT

EMBANKMENT SECTIONS

STATION 49+25.1 TO STATION 102+00

In 29 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 6

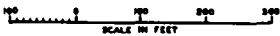
Scale as shown  
KANSAS CITY, MO  
SEPTEMBER 1960

Submitted  
Chief Dam & Tide Sect  
Drawn by  
N.F.P.

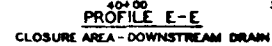
Recommended  
Chief Engineering Division  
Checked by  
R.G.F.

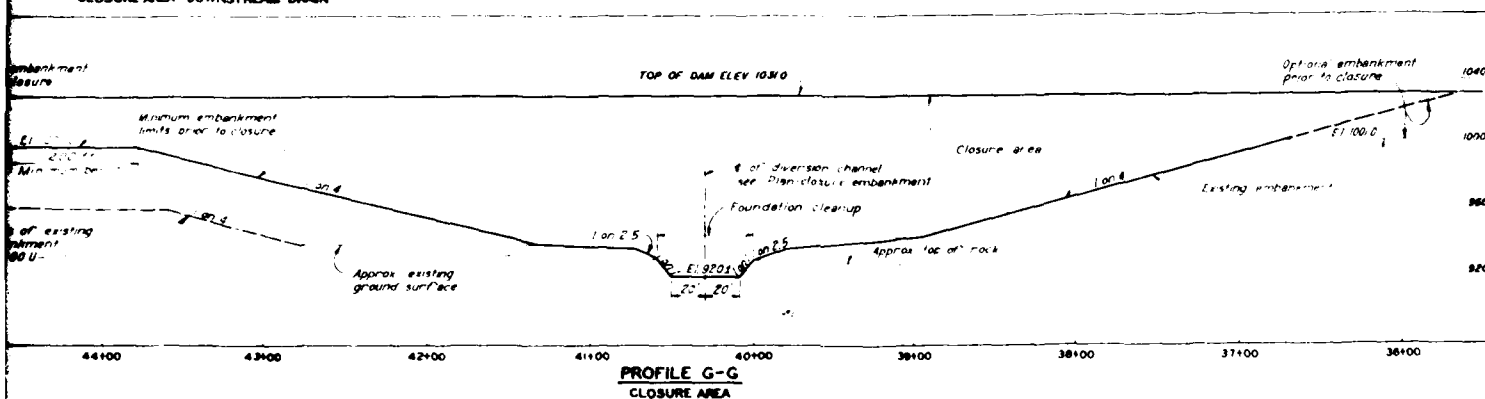
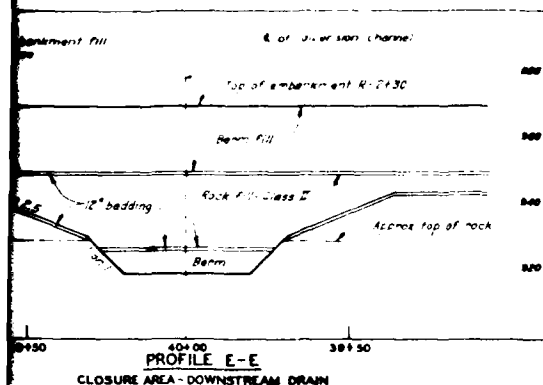
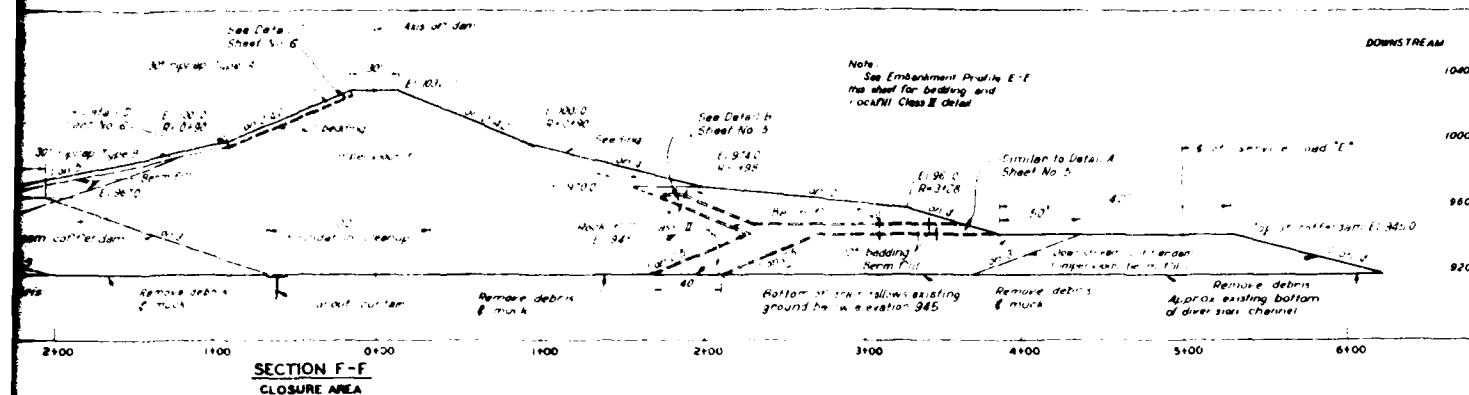
Approved  
Col. C.E. District Engineer  
File No.  
0-3-4570





### PLAN-CLOSURE EMBANKMENT





**NOTE**  
Profile and section slopes and ranges  
are given perpendicular to axis of dam.

## RECORD DRAWING

OCTOBER 1963  
CONTRACT NO DA-23-089-CRONG-61-290

(A)	Revised for 'As Built' conditions	5764	57
SYM.	DESCRIPTION	DATE	APPD.
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
COMPLETION OF EMBANKMENT

## CLOSURE AREA SECTION, PLAN AND PROFILES

in 29 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAAS CITY

Sheet No. 7

Scale: as shown  
KANSAS CITY, MO.  
SEPTEMBER 1980

Submitted Carl D. [Signature]  
 Chief, Crime & Fals. Sec.  
 Drawn by \_\_\_\_\_ Traced by \_\_\_\_\_  
 H.E.B. S.W.W.

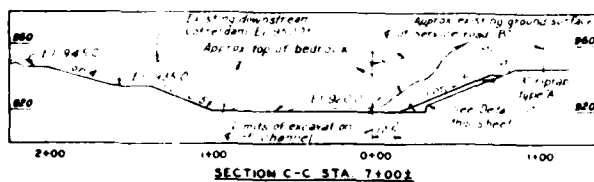
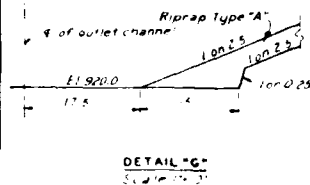
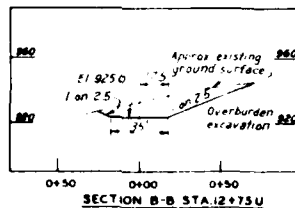
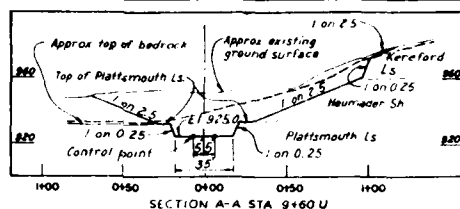
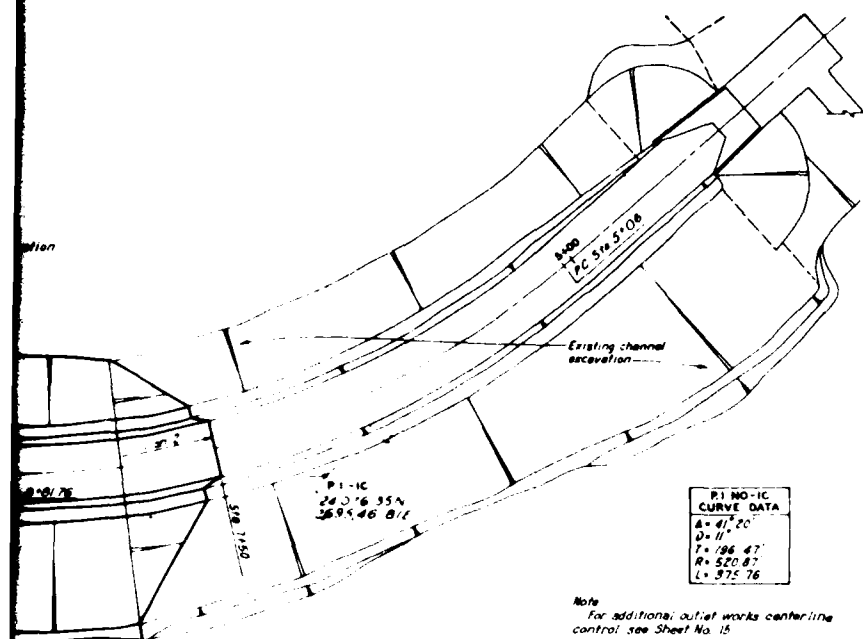
Recommended  
*James E. Gail*  
 Chief, Engineering Branch  
 Checked by  
 R.E.

Approved  
*[Signature]*  
 Col. C. E. Sawyer, Engineer  
 File No.  
 9-3-49

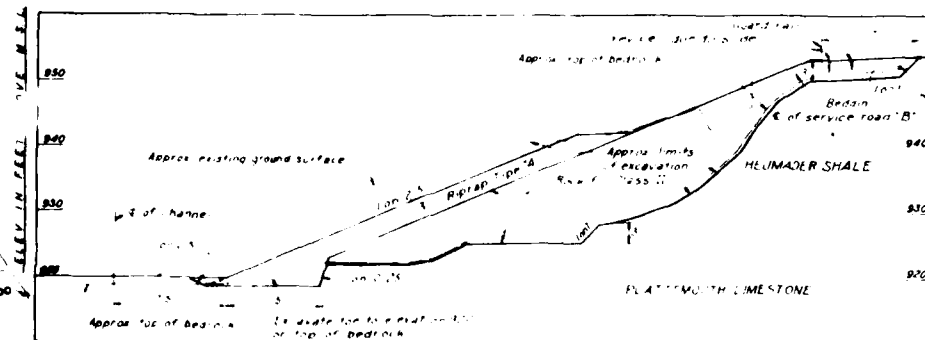
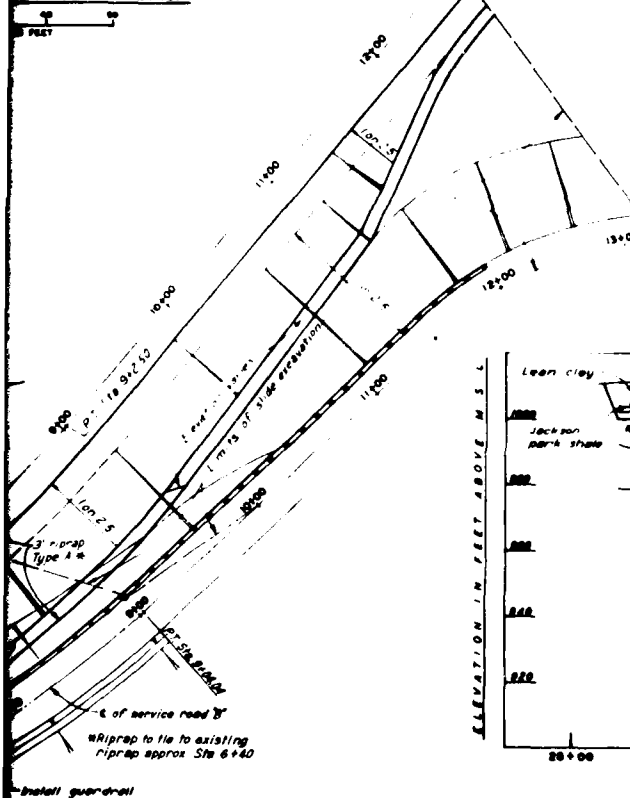
9-3-91

PLATE NO. 26

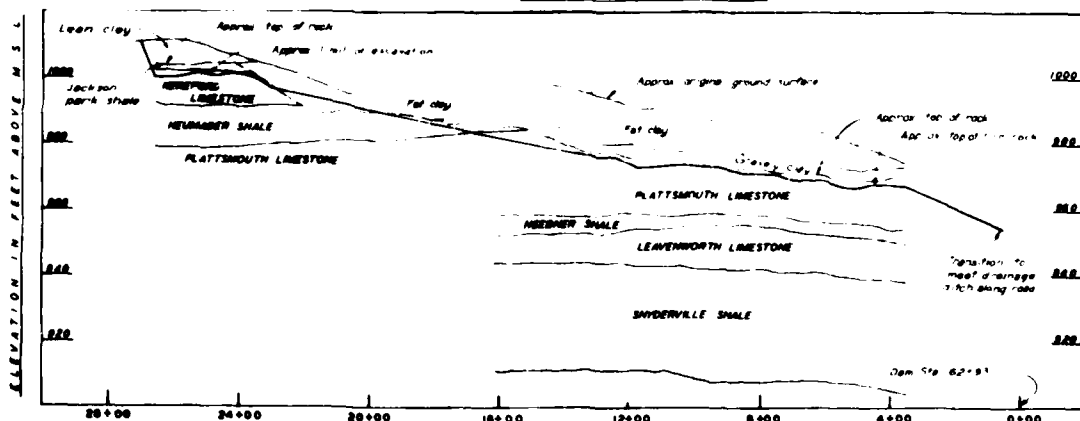




## CHANNEL EXCAVATION



## OUTLET CHANNEL SECTION



P1-1C  
24.0° 16.354  
269.46 8.11

Note  
For additional outlet works centerline control see Sheet No. 15

## RECORD DRAWING

OCTOBER 1959  
CONTRACT NO. DA-23-088-0000-41 225

REVISIONS	DESCRIPTION	DATE	APP'D
1	Revised for "As Built" conditions	5-7-64	J.F.R.

In 29 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

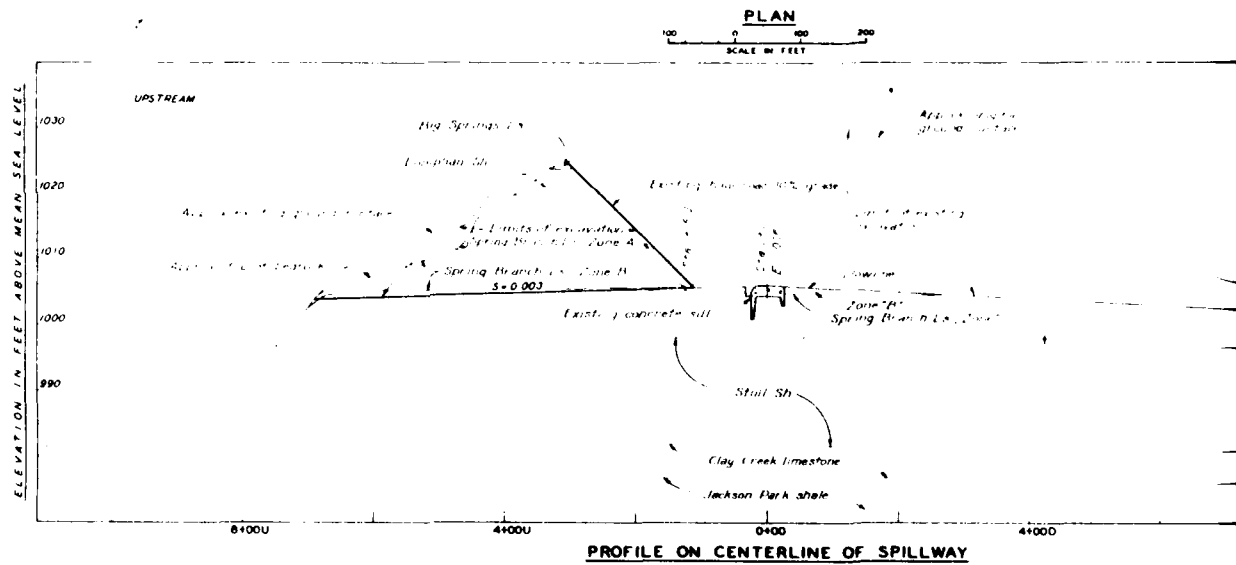
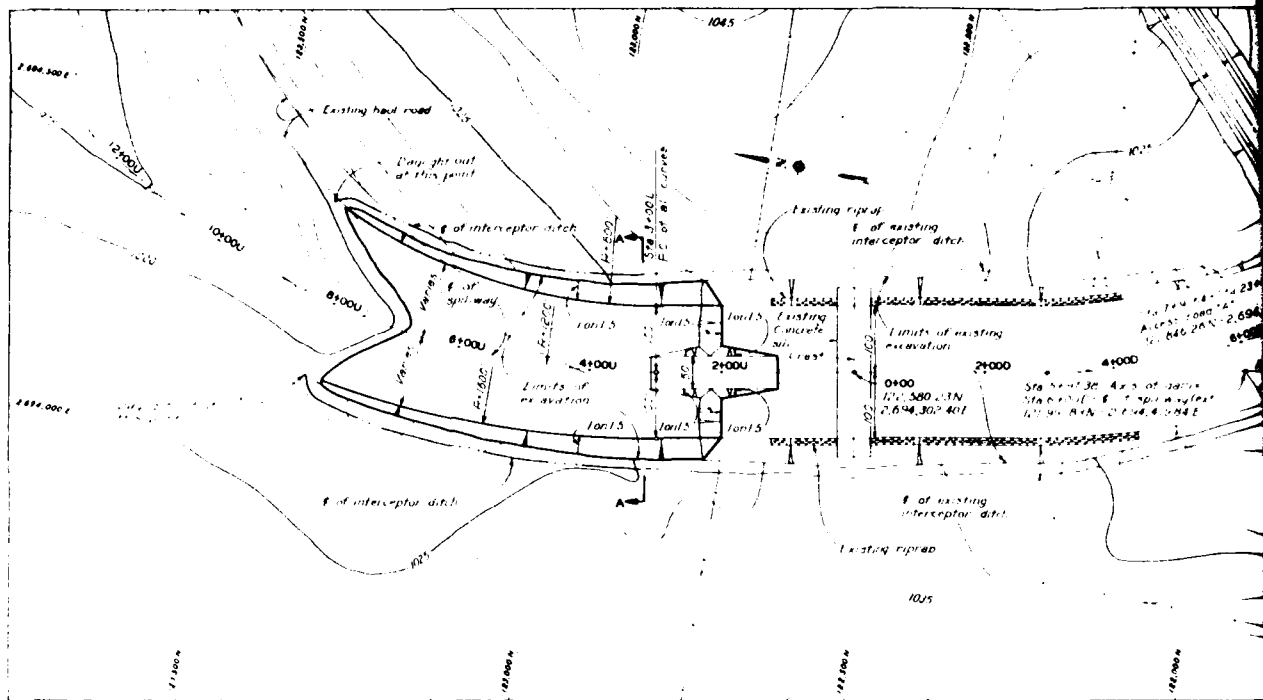
HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
COMPLETION OF EMBANKMENT  
OUTLETWORKS EXCAVATION  
PLANS AND SECTIONS AND  
FOUNDATION DRAIN PROFILE

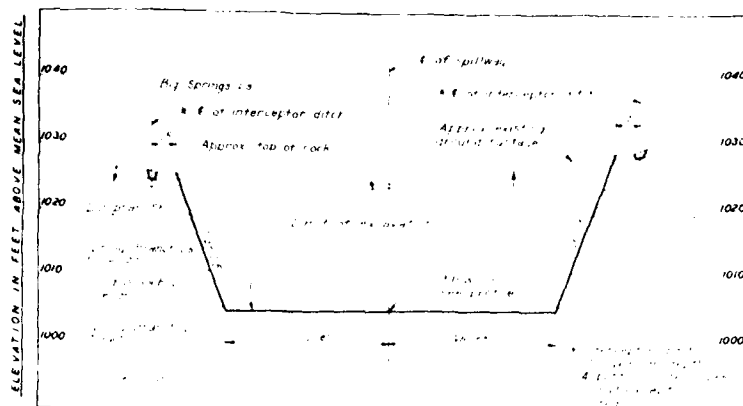
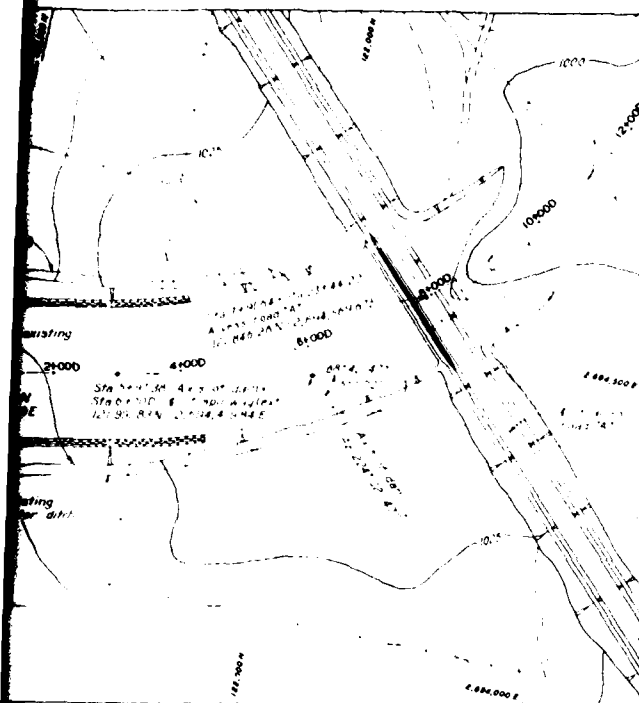
Sheet No. 8

Scale: as shown  
KANSAS CITY, MO.  
SEPTEMBER 1959

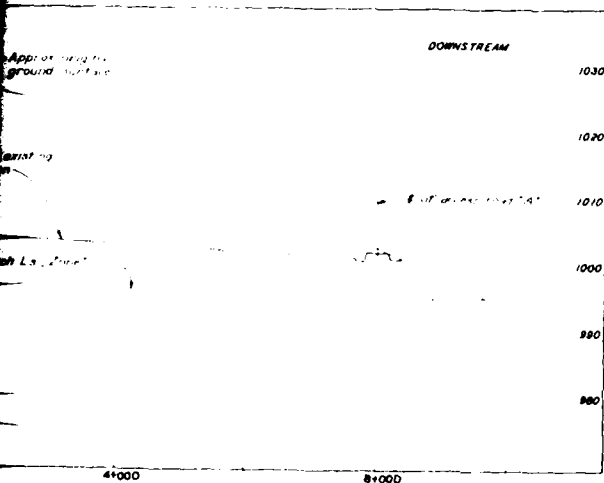
Submitted by: J.F.R.  
Checked by: J.F.R.  
Recommended by: R.G.F.  
Approved by: C.E. Baker, District Engineer  
File No. 0-3-479

PLATE NO. 27





**SECTION A - A**

[illegible][illegible]

# RECORD DRAWING

OCTOBER 1963

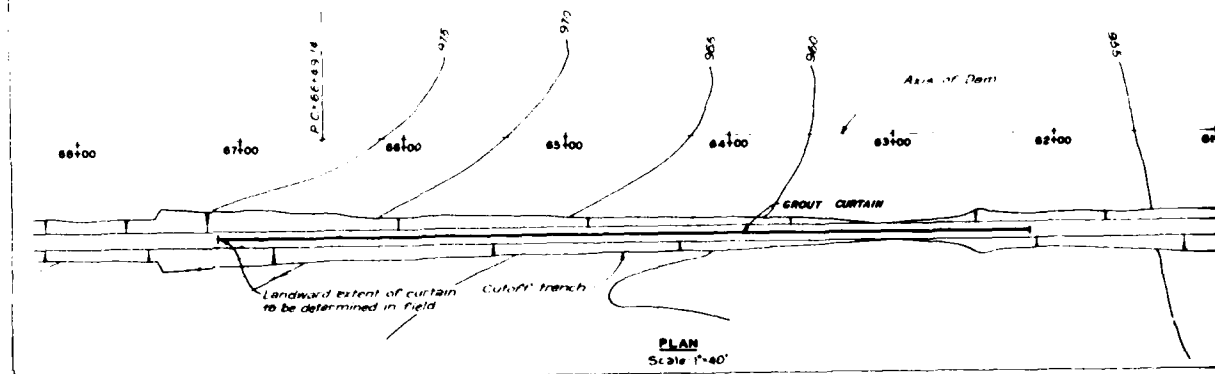
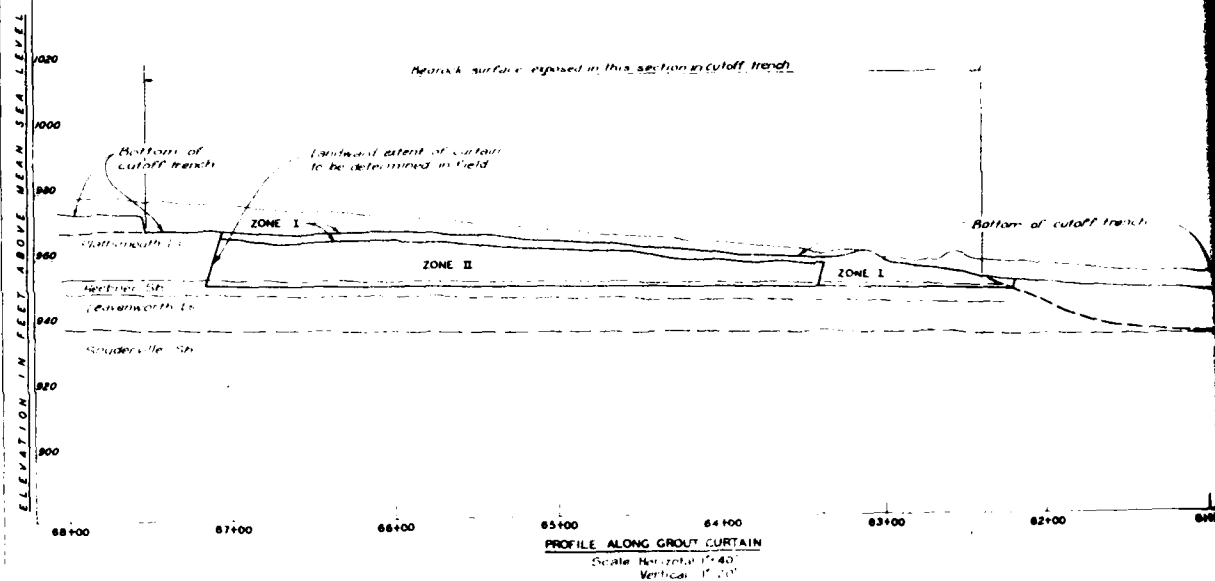
(A)	Revised for As Built condition	8-66	
SYM	DESCRIPTION	DATE	APP'D
	REVISIONS		

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA DAM**  
 COMPLETION OF EMBANKMENT  
 SPILLWAY EXCAVATION  
 PLAN, PROFILE AND SECTION AND  
 DESCRIPTION OF EXCAVATIONS

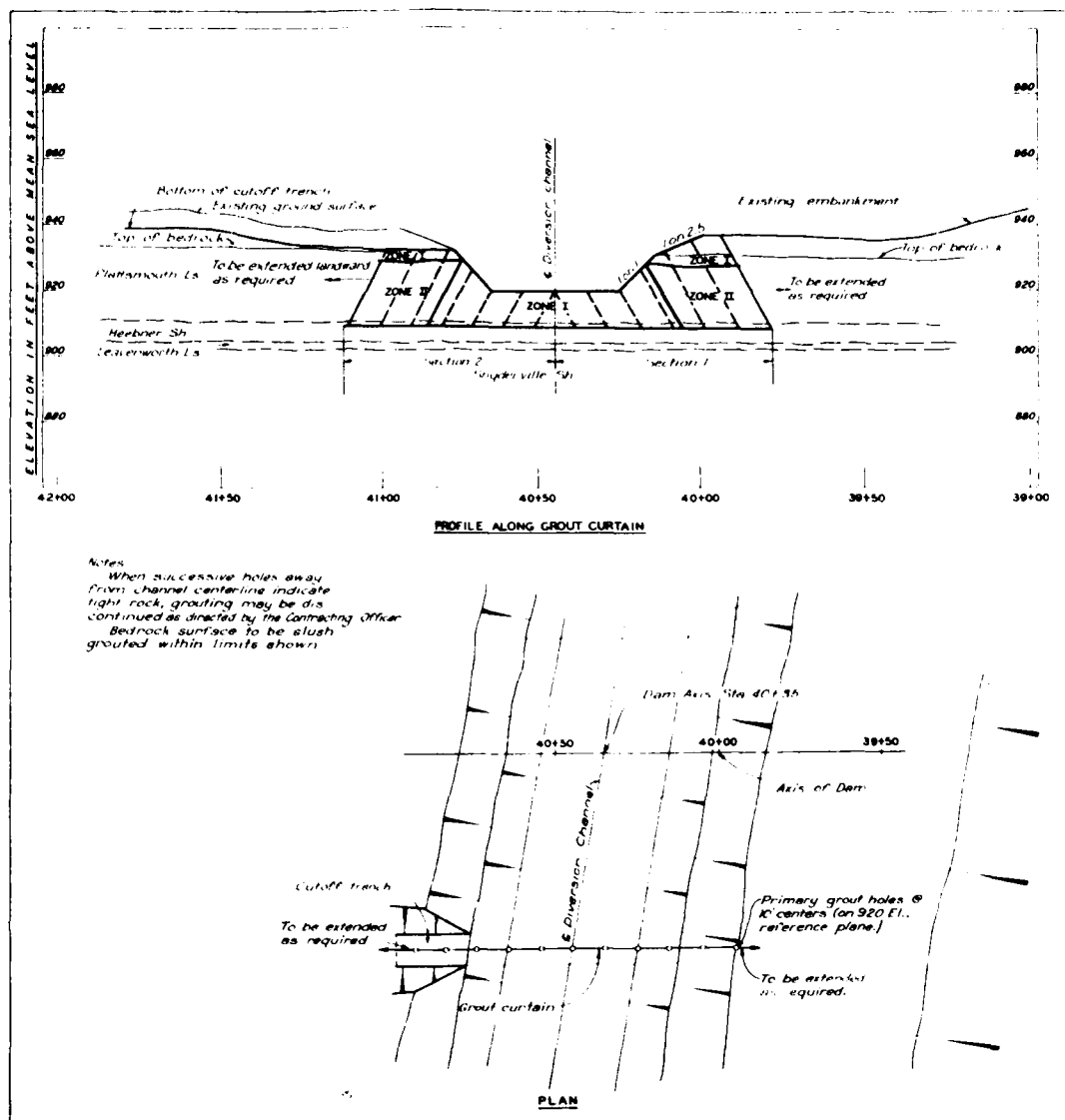
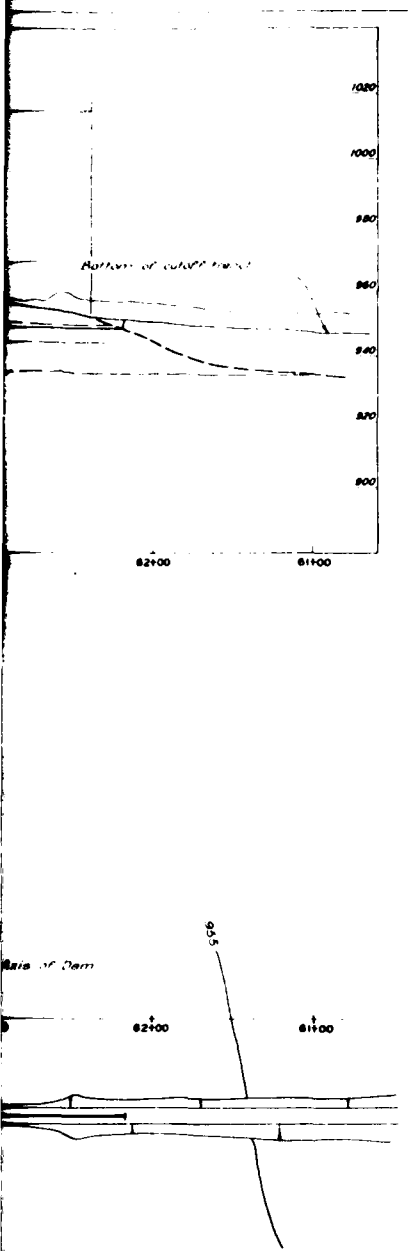
In 29 sheets                      Sheet No 9                      Scale as shown  
U S ARMY ENGINEER DISTRICT                      KANSAS CITY, MO  
KANSAS CITY                      SEPTEMBER 1960

Submitted by <i>E. L. Dodson</i>	Recommended by <i>[Signature]</i>	Approved <i>[Signature]</i>
Civil Plans and Design Section Checked by NFP WDT	Engineering Division Checked by RGF	Col. C.E. District Engineer FAO 0-3-67

PLATE NO. 20







FOUNDATION GROUTING-DIVERSION CHANNEL

Scale 1"=20'

## NOTES:

Temporary casing is to be set thru overburden and into bedrock for zone I.

Zone I is the weathered zone near the top of bedrock.

Holes shall be grouted by the stage method.

Primary holes are on 10' spacing.

The number of intermediate holes will be determined by the split spacing method.

For slush grouting on right abutment see Sheet No. 26.

Revised for "As Built" conditions	5-7-64
DESCRIPTION	DATE
REVISIONS	APP'D.

HUNDRED AND TEN MILE CREEK, KANSAS

# POMONA DAM COMPLETION OF EMBANKMENT

## CURTAIN GROUTING PLAN AND PROFILE

In 29 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 10

Scale as shown  
KANSAS CITY, MO.  
SEPTEMBER 1960



RECORD DRAWING

DESIGNED BY  
CHECKED BY  
DRAWN BY  
K.R.L.

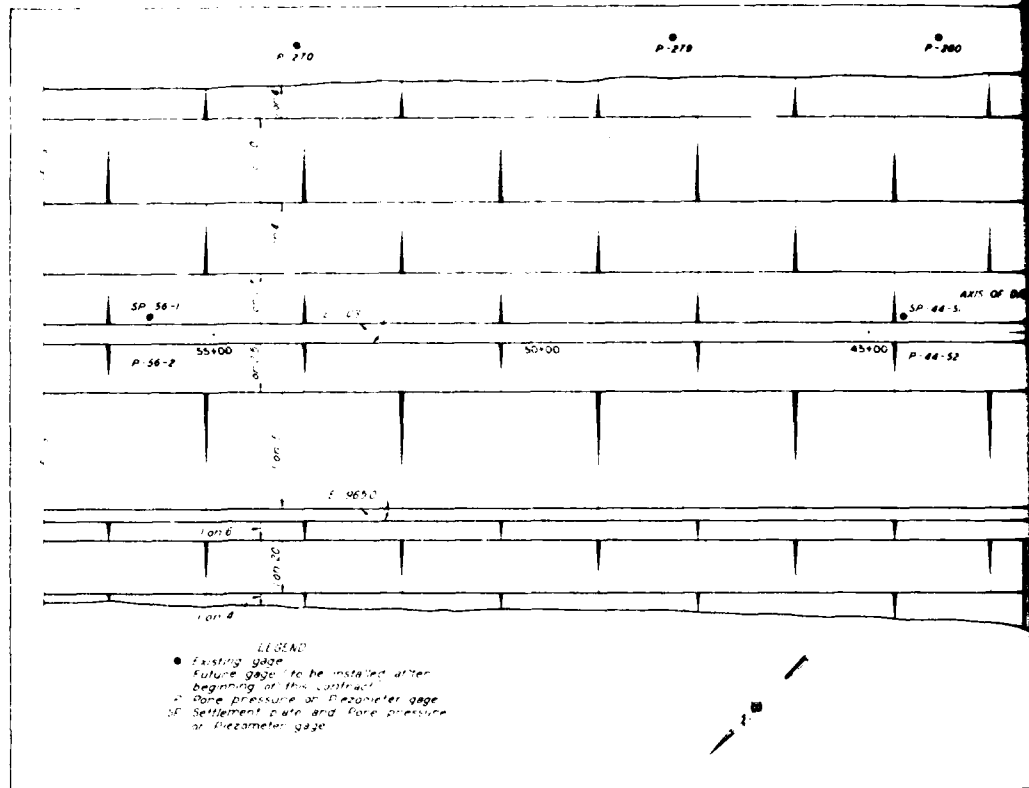
Subscribed  
Checked by  
E.L.H.

Recommended  
Checked by  
C.E.

Approved  
Checked by  
C.E.

FILE NO.  
6-3-420

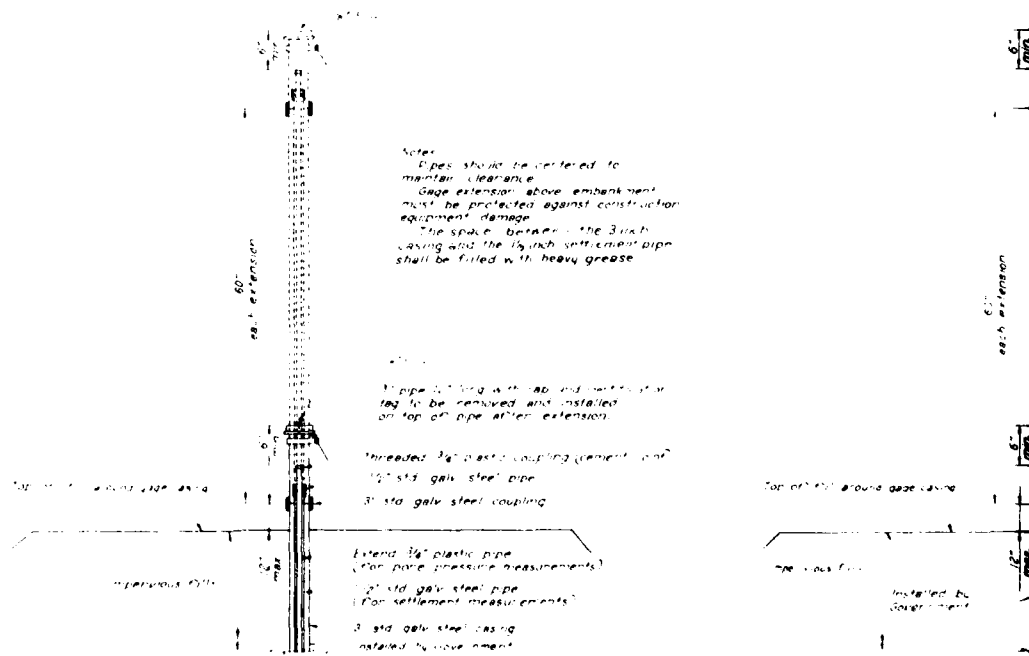
PLATE NO. 29



PIEZOMETER AND SETT

100' 0' 100' 0' 100' 0'

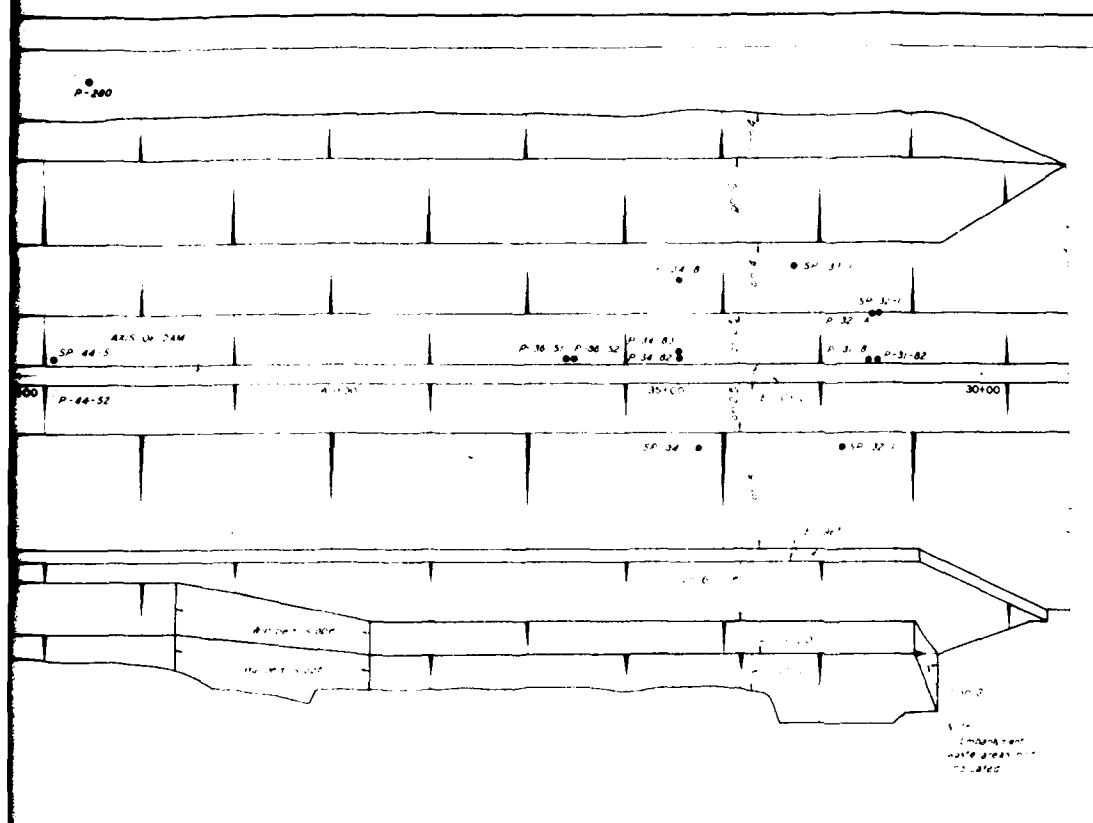
SCALE IN FEET



COMBINATION SETTLEMENT PLATE AND PIEZOMETER GAGE  
EXTENSION DETAIL

Not to scale

PIEZOMETER



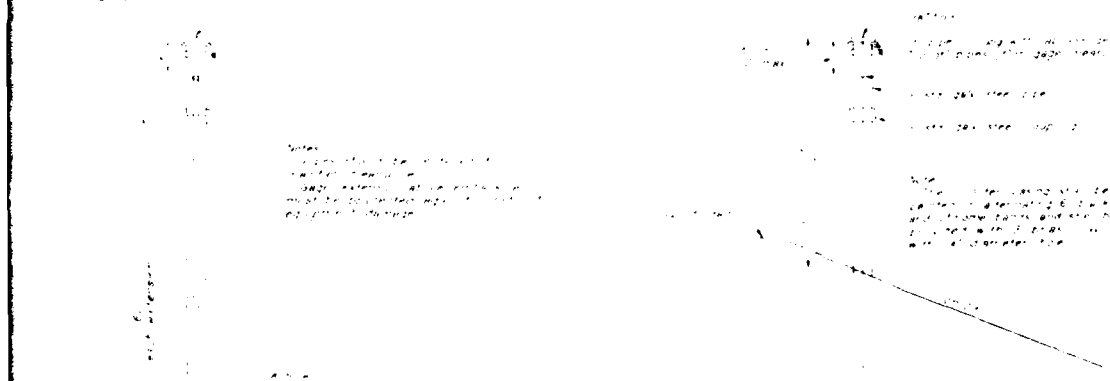
GAGE DATA			
NUMBER	STATION	RANGE	APPROX LENGTH OF EXTENSION
P-31-B1	31+79.50	3120.00	15
P-31-B2	31+80	3120.00	25
SP-32-1	31+72	3120.00	Extension completed
SP-32-2	31+76.00	3120.00	Extension completed
SP-32-3	31+80	3120.00	Extension completed
SP-33	31+80	3120.00	Extension completed
SP-34	31+80	3120.00	Extension completed
P-34-B	34+79.85	3425.00	Extension completed
P-34-B2	34+79.85	3425.00	27
P-34-B3	34+79.85	3425.00	22
P-36-1	36+50	3620.00	25
P-36-2	36+50	3620.00	29
P-36-3	36+50	3620.00	Extension completed
P-44-5	44+50	4425.00	25
P-44-52	44+50	4425.00	5. Max
P-44-53	44+50	4425.00	Extension completed
P-44-54	44+50	4425.00	Extension completed
P-44-55	44+50	4425.00	25
P-44-56	44+50	4425.00	25
P-44-57	44+50	4425.00	25

Note: Pressure on Piezometer gage  
 1. Distribution Settlement plate of  
 2. Force pressure on Piezometer gage  
 3. Observation instruments will be  
 4. Protected against construction hazards  
 5. P-44-52 and P-44-53 gages are installed  
 6. after beginning of construction  
 7. Location information is approximate

Note:  
 For location of settlement monuments  
 along top of dam see table in O & M  
 Manual

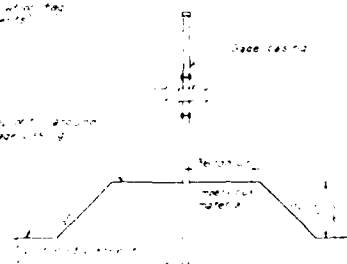
## PIEZOMETER AND SETTLEMENT GAGES

Scale: 1" = 100'



## TOP OF GAGE DETAIL

Scale: 1" = 100'



## EMBANKMENT DETAIL AT GAGES

Scale: 1" = 100'

## RECORD DRAWING

OCTOBER 1963

CONTRACT NO. DA-23-028 (ENGR 61-250)

REVISIONS

HUNDRED AND TEN MILE CREEK, KANSAS

POMONA DAM  
COMPLETION OF EMBANKMENTPIEZOMETER AND SETTLEMENT GAGES  
PLAN AND DETAILS

## PIEZOMETER GAGE EXTENSION DETAIL

Scale: 1" = 100'

In 29 sheets

Sheet No. 11

U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Scale as shown  
KANSAS CITY, MO  
SEPTEMBER 1960



Submitted  
Chief, Plans & Tech. Serv.  
Drawn by  
M.F.P.

Recommended  
Chief, Engineering Division  
Checked by  
R.G.F.

Approved  
Chief, District Engineer  
File No.  
O-3-48

PLATE NO 30





OCTOBER 1963  
CONTRACT NO DA 23-078 CIVENG 61 750



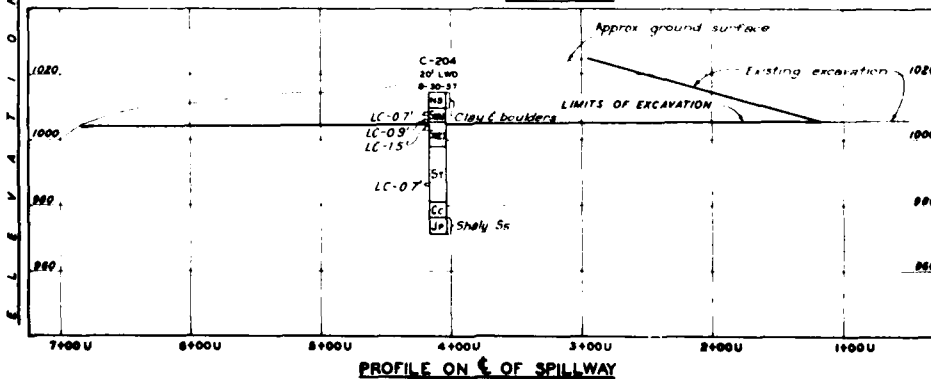
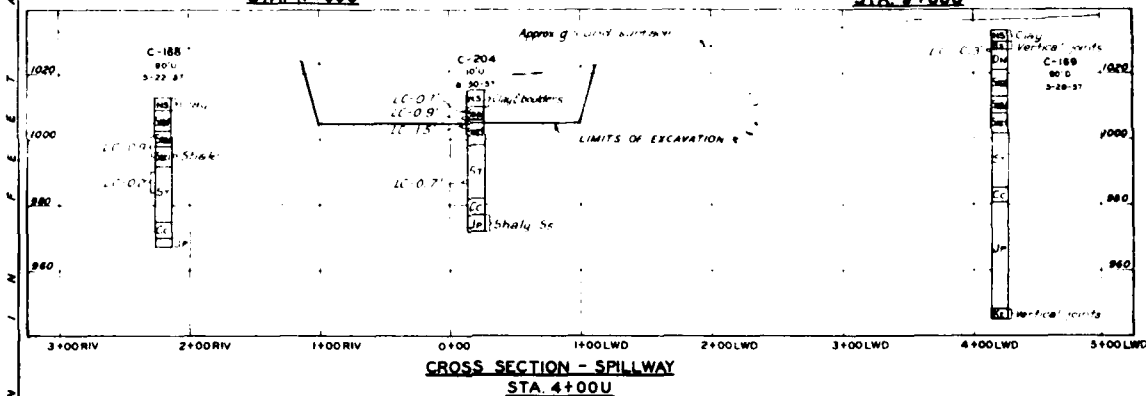
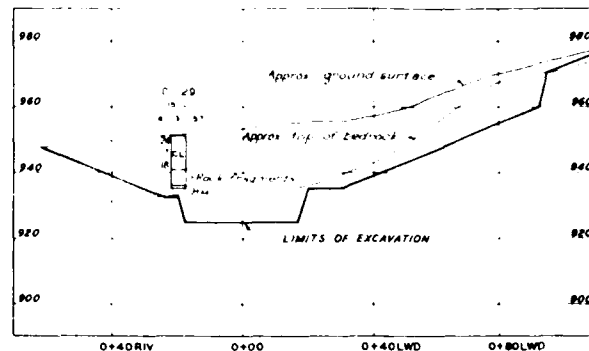
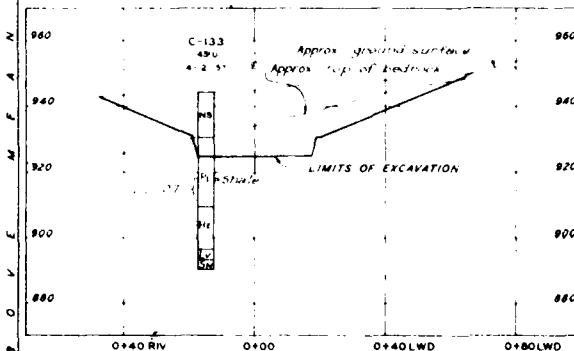
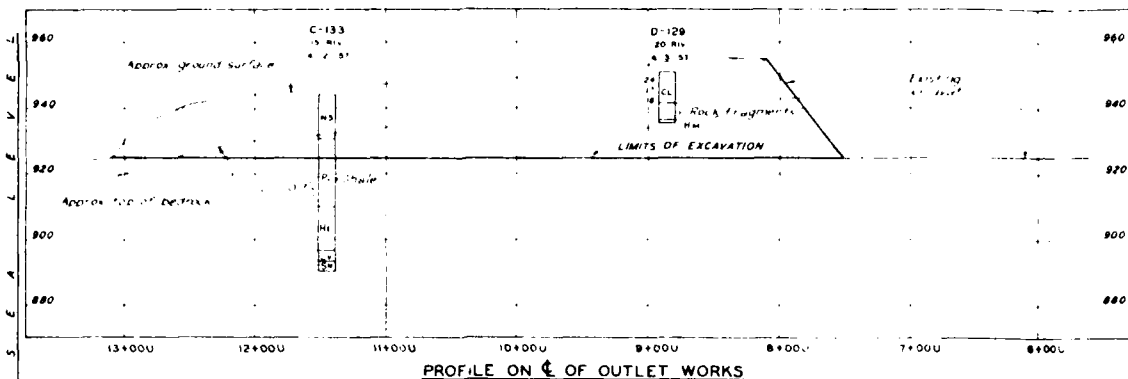
SYN	DESCRIPTION	DATE	APPRO
	REVISIONS		

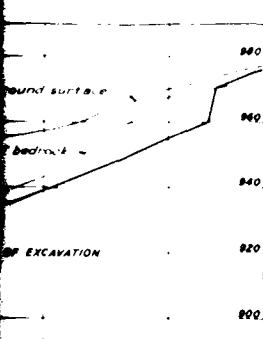
SEPTEMBER 1960

Submitted <i>W. J. Golder</i> for Ecology Section Checked by H. L. C. H. L.	Recommended <i>W. J. Golder</i> Chief Engineering Division Checked by C. R. G.	Approved <i>W. E. Parnham</i> Chief, Ecology Section File No.
---	--	--

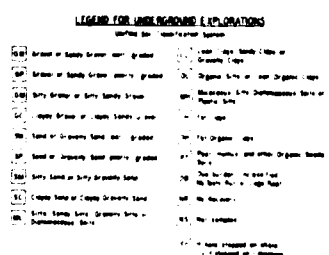
0-2-400

PLATE NO. 31





A photograph of a vertical metal scale or ruler. The scale has markings from 0 to 100. Labels include "C-109", "80 0", "> 20-3\"", "1000", "860", "860", and "Vertical center".

[illegible]

NOTES

- 1. This is a shale zone within a limestone member
- 2. Column is not shown to scale

NOTES  
1. This is a shale zone within a limestone member  
2. Column is not shown in scale

Station and range of outlet works and spillway sections and profiles are indicated to centerline of the respective structures.

For other logs of underground excavations see Sheets Nos. 26 and 27.

(A)	Revised for "As Built" conditions	5764	
SYM	DESCRIPTION	DATE	APP'D
REVISIONS			

In 29 sheets  
U. S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 25

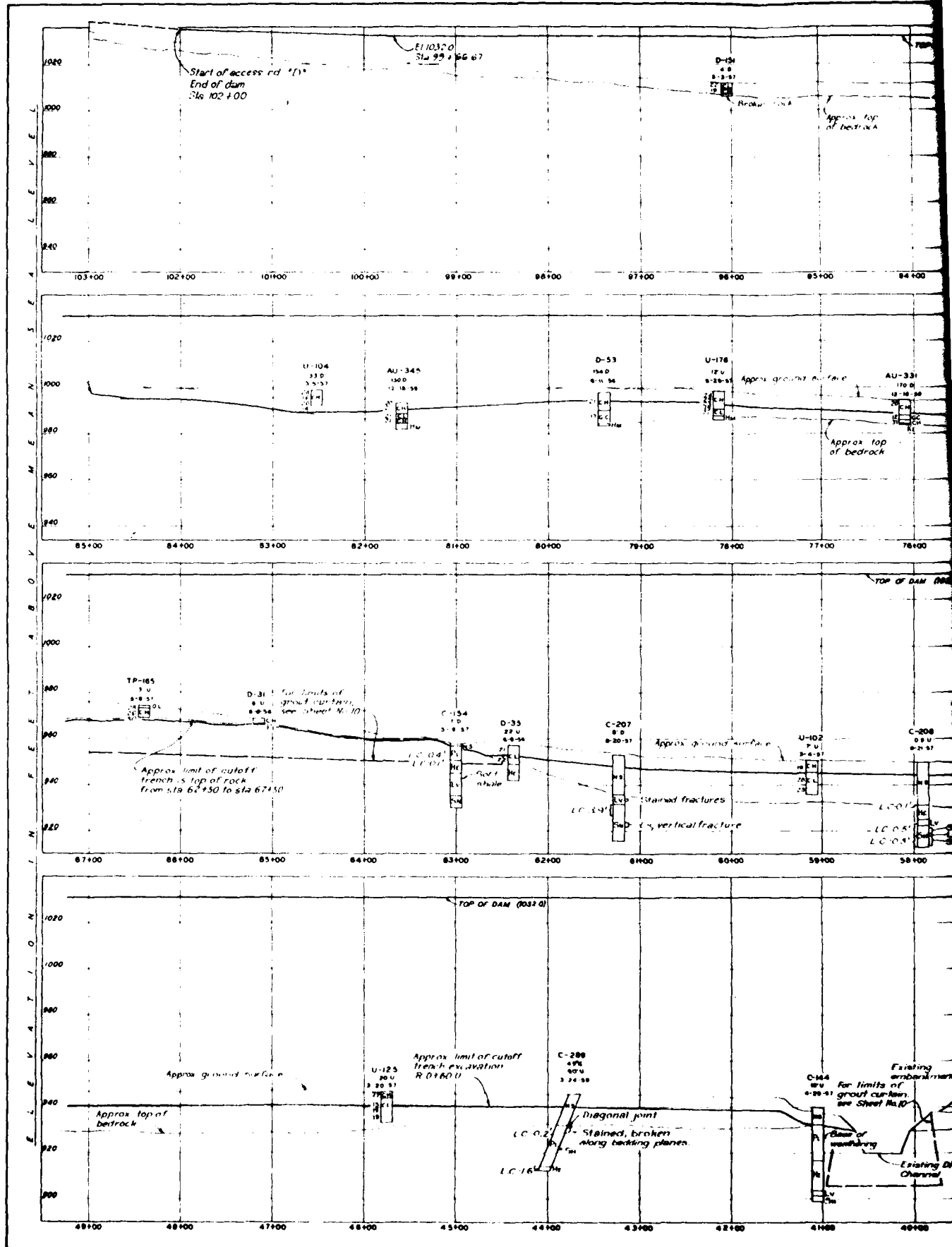
Scale: as shown  
KANSAS CITY, MO  
SEPTEMBER, 1960

Submitted *[Signature]*  
Chief, General Services Division

Recommended *[Signature]*  
Chief, Engineering Division

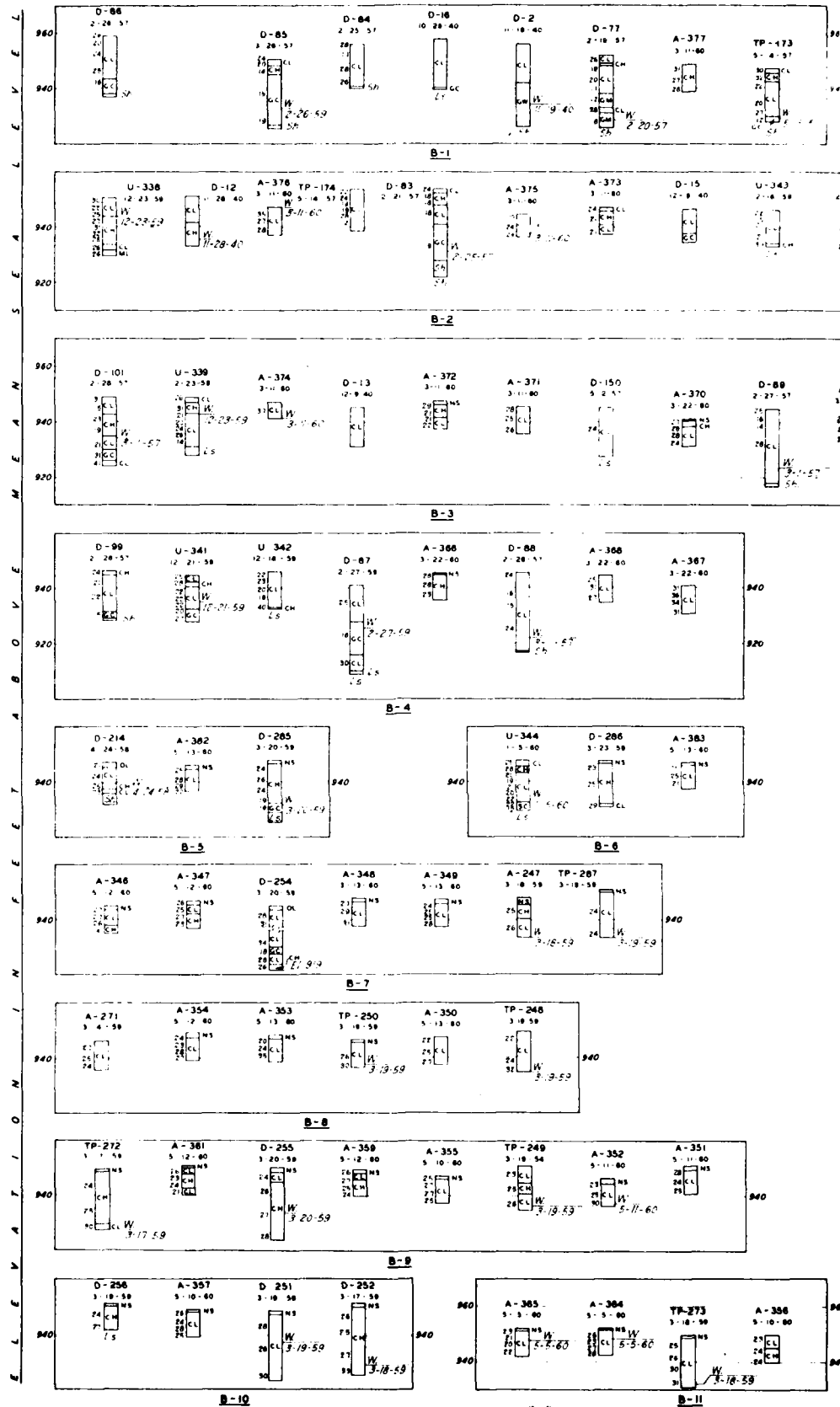
Approved *[Signature]*  
Col. C. E. Blanton, Engineer  
File No.

Drawn by Traced by

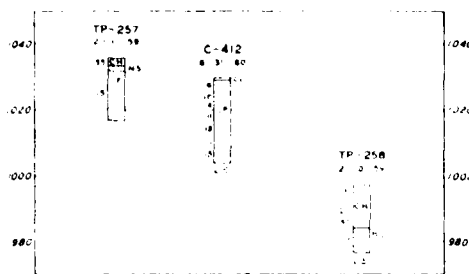




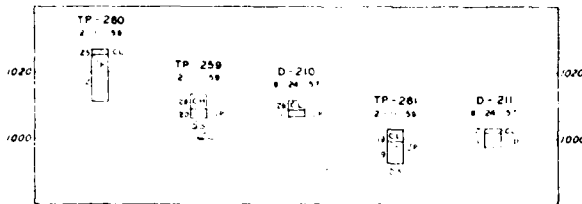




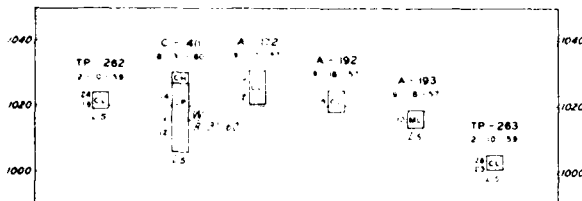
PROFILES - BORROW AREA "B"



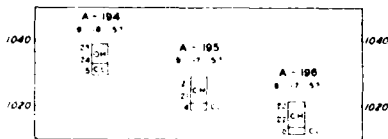
F-1



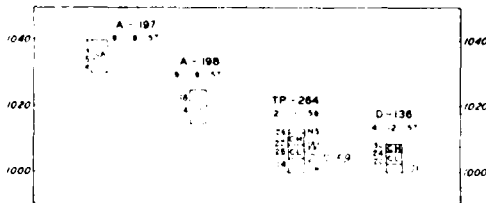
F-2



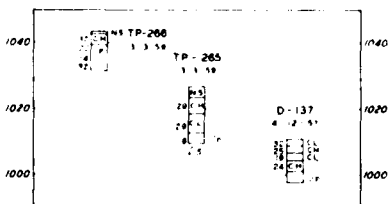
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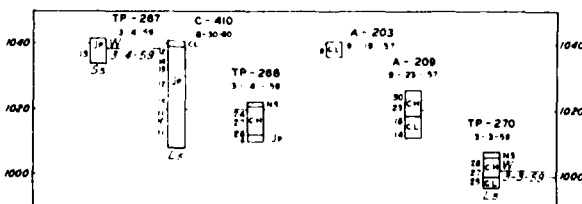
F-4



F-5

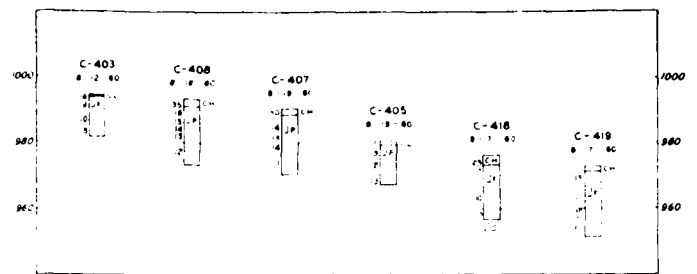


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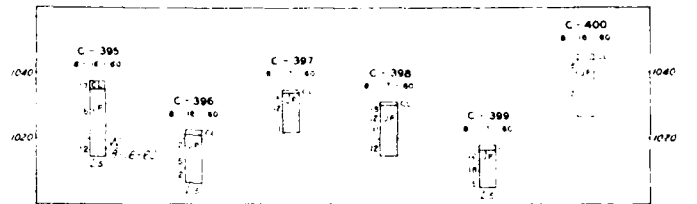


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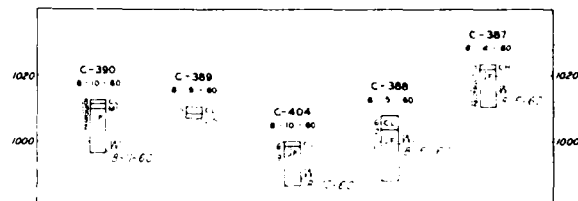
PROFILES - BORROW AREA "F"



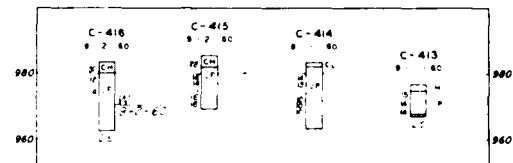
PROFILE - BORROW AREA "D"



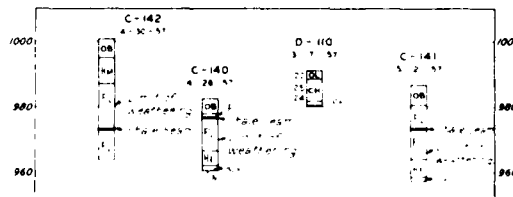
PROFILE - BORROW AREA "E"



PROFILE - BORROW AREA "G"



PROFILE - BORROW AREA "H"



PROFILE - QUARRY SITE NO. 1

Note:  
For legend of Undergr. &  
Excavations see Sheet No. 25

## RECORD DRAWING

OCTOBER 1963

CONTRACT NO. DA-23-028 CIVE NG 61 250

As Revised for As Built Conditions  
SYMBOL DESCRIPTION REVISIONS

DATE APP'D

HUNDRED AND TEN MILE CREEK, KANSAS

POMONA DAM  
COMPLETION OF EMBANKMENTLOGS OF UNDERGROUND EXPLORATIONS  
BORROW AREAS AND QUARRY SITE

In 29 sheets  
U.S. ARMY ENGINEER DISTRICT  
KANSAS CITY

Sheet No. 27

Scale: as shown  
KANSAS CITY, MO  
SEPTEMBER 1960



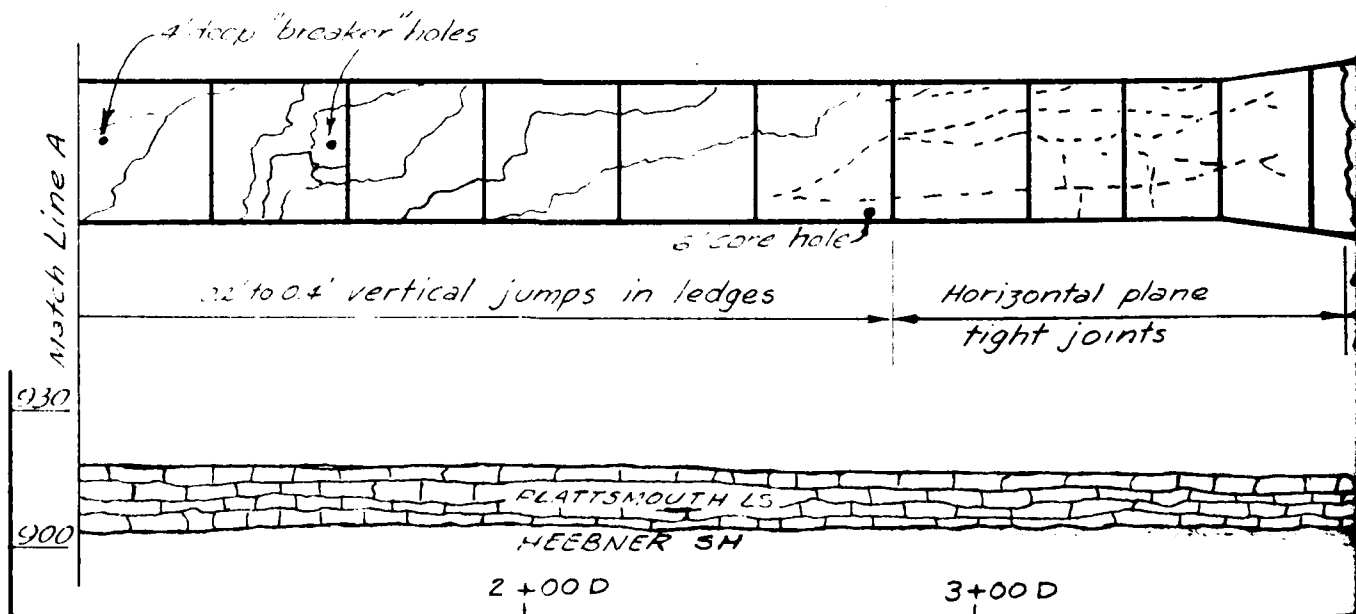
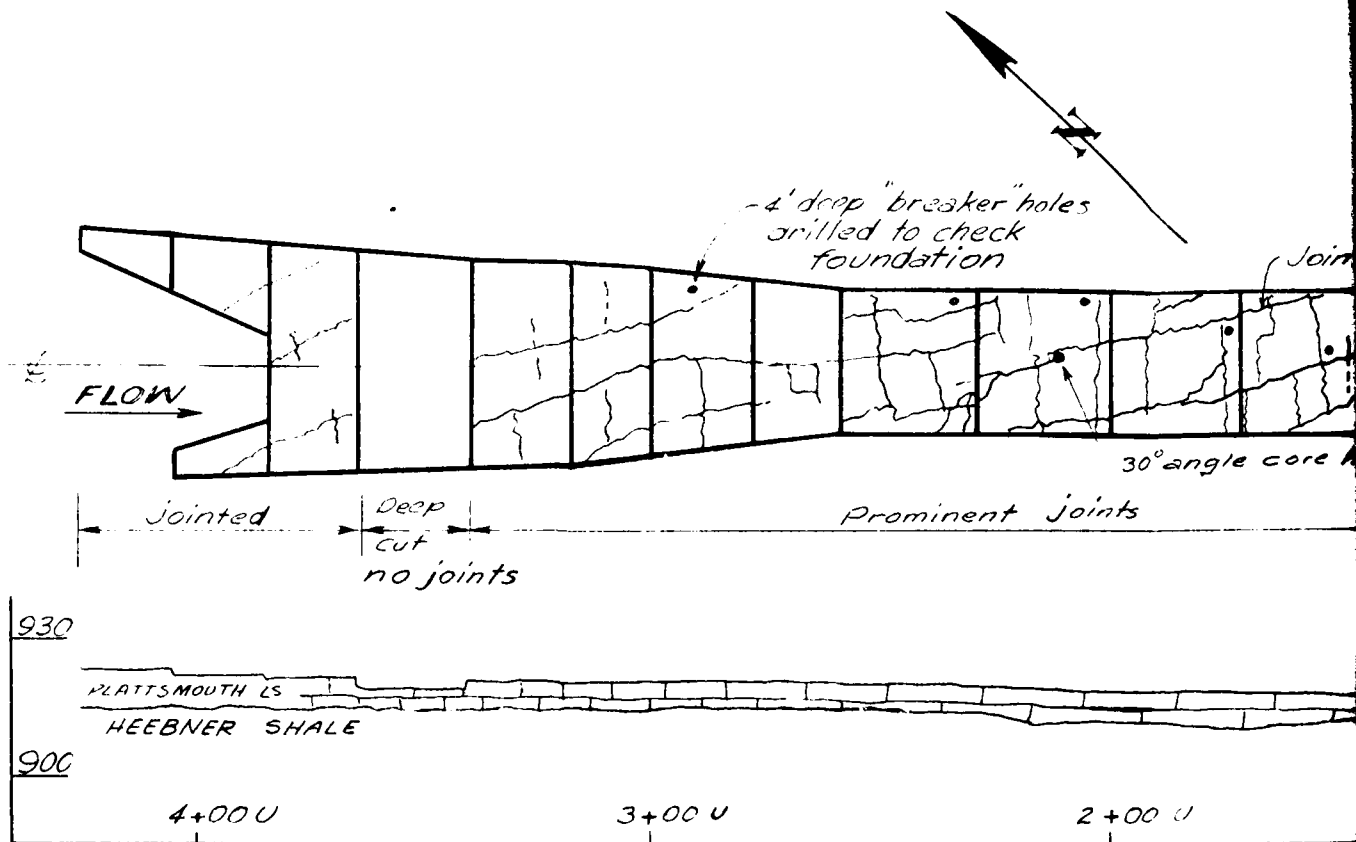
Submitted by  
Chief, Dams & Tolls Sect.  
Drawn by  
N.F.P.

Recommended by  
Chief, Engineering Division  
Checked by  
B.R.N.

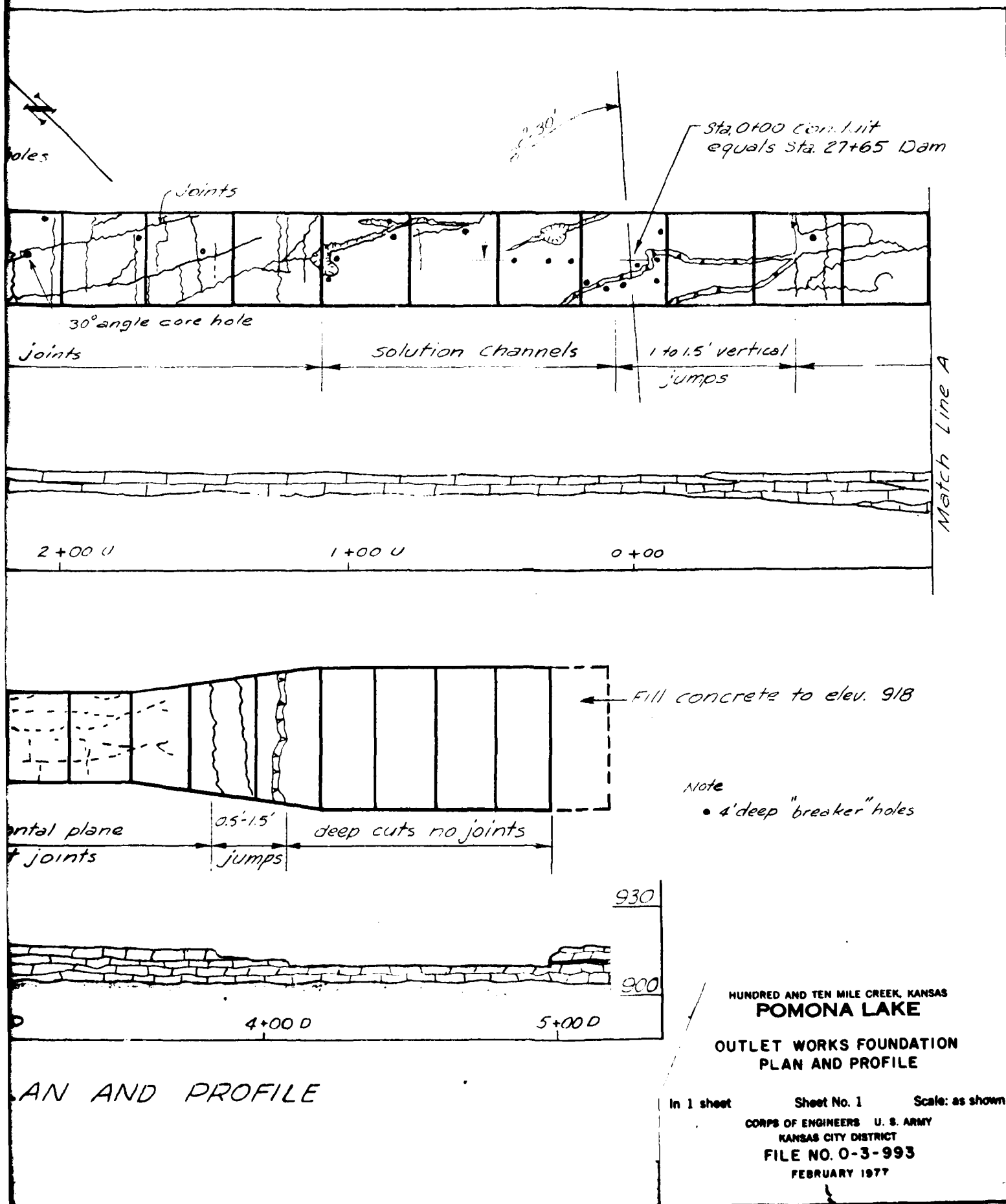
Approved by  
Col. C.E. District Engineer  
File No.  
R.G.F.

Q-3-497

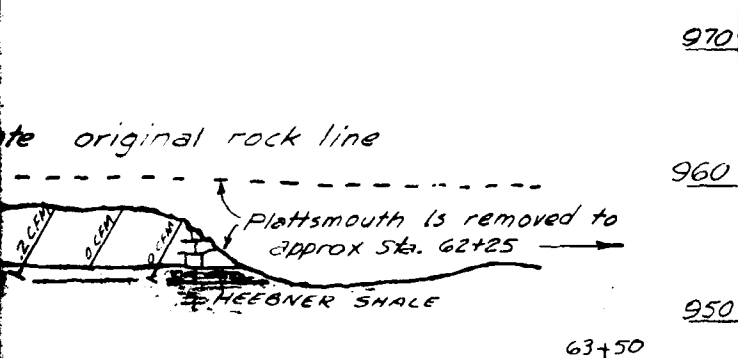
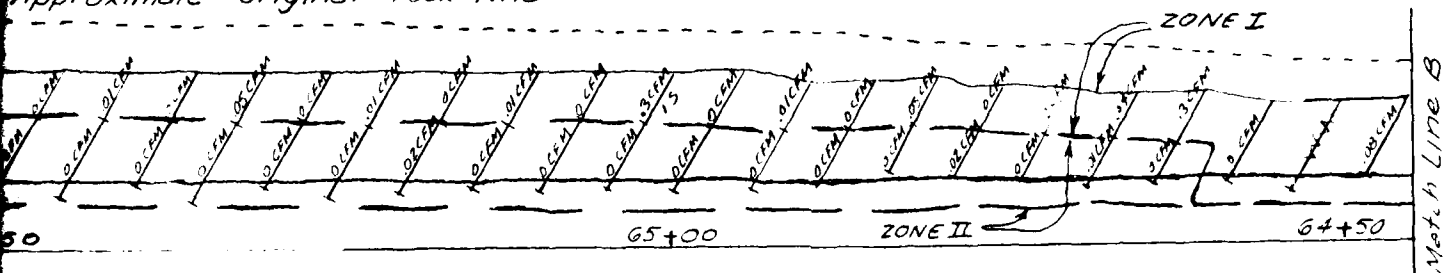
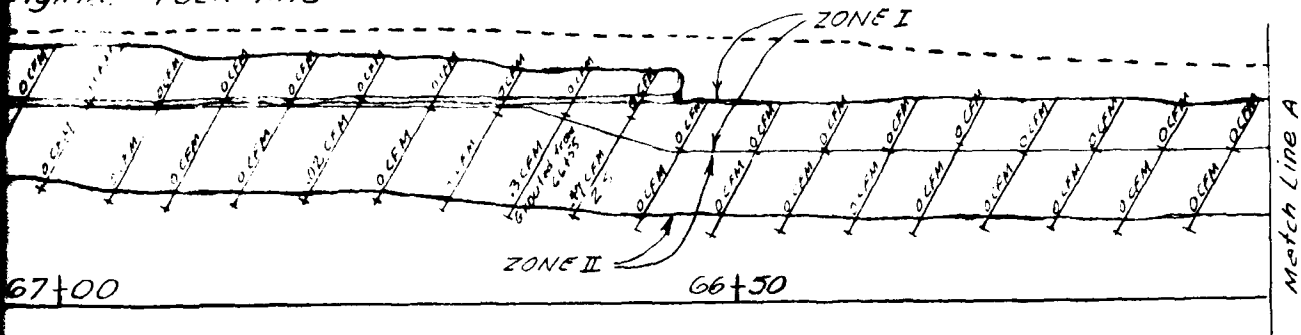
PLATE NO. 34



OUTLET WORKS FOUNDATION PLAN AND PA  
scale as shown



SCALE AS SHOWN



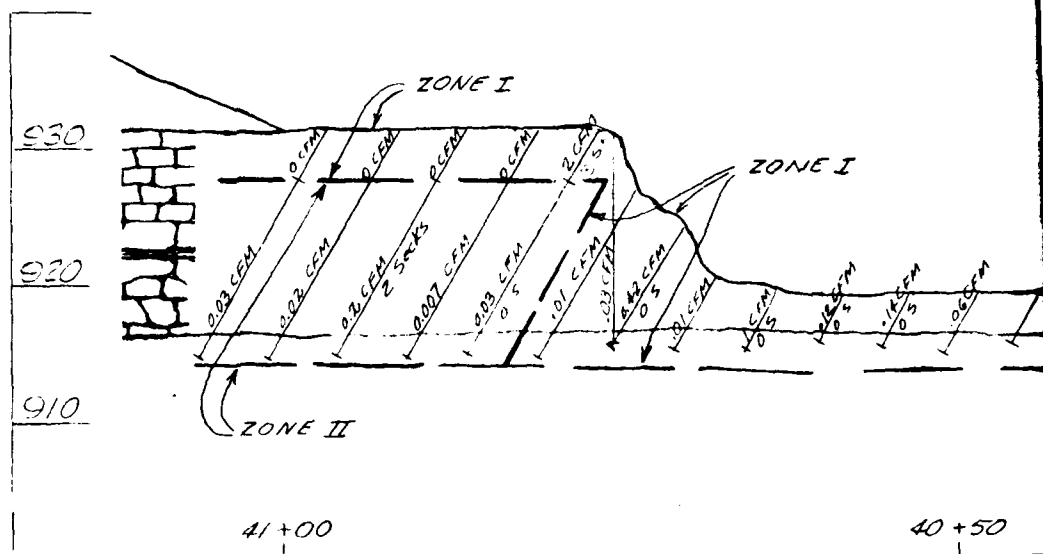
**SHOWN**

For notes and legend see plate No. 37.

COMPLETION OF EMBANKMENT GROUTING  
STA 67+50 TO STA. 63+50

**In 1 sheet                      Sheet No. 1                      Scale: as shown**  
**CORPS OF ENGINEERS   U. S. ARMY**  
**KANSAS CITY DISTRICT**  
**FILE NO. 0-3-994**  
**FEBRUARY 1977**

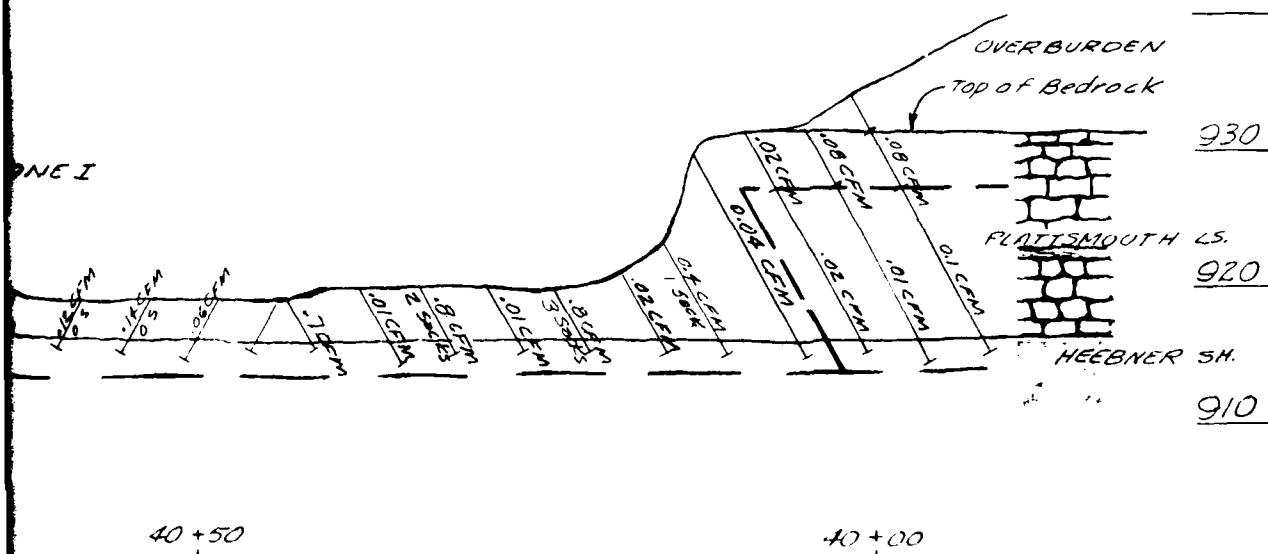
**PLATE NO. 36**



DIVERSION CHANNEL GROUTING  
SCALE AS SHOWN

0.01 CFM  
2.5' to 5'





GROUTING STA 41+00 TO STA 40+00

Legend

- Primary hole
- secondary hole
- tertiary hole
- Packer set depth
- Pressure Test Gallons per minute water take
- Grout take in sacks of cement

HUNDRED AND TEN MILE CREEK, KANSAS  
POMONA LAKE

## POMONA LAKE

## DIVERSION CHANNEL GROUTING STA 41+00 TO STA. 40+00

**STA 41+00 TO STA. 40+00**

**In 1 sheet**

Sheet No. 1

**Scale: as shown**

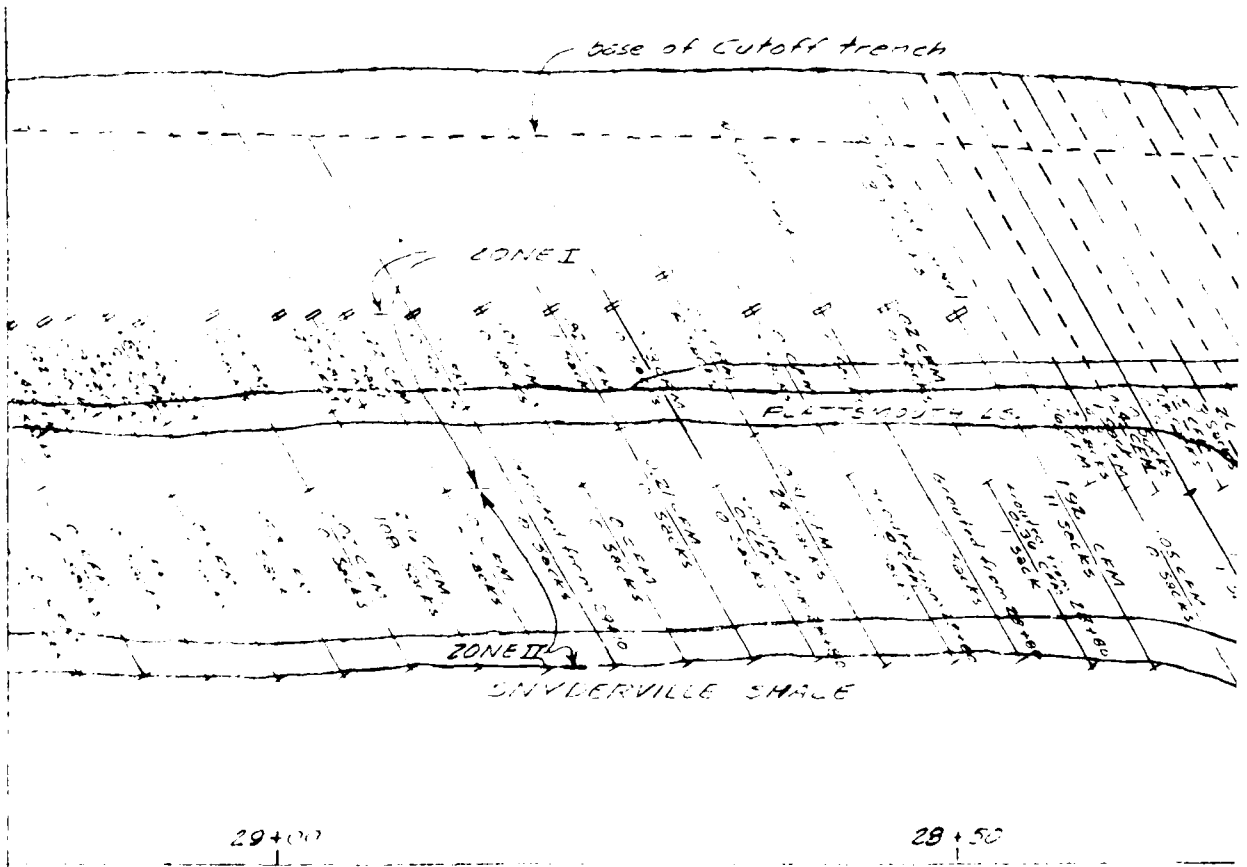
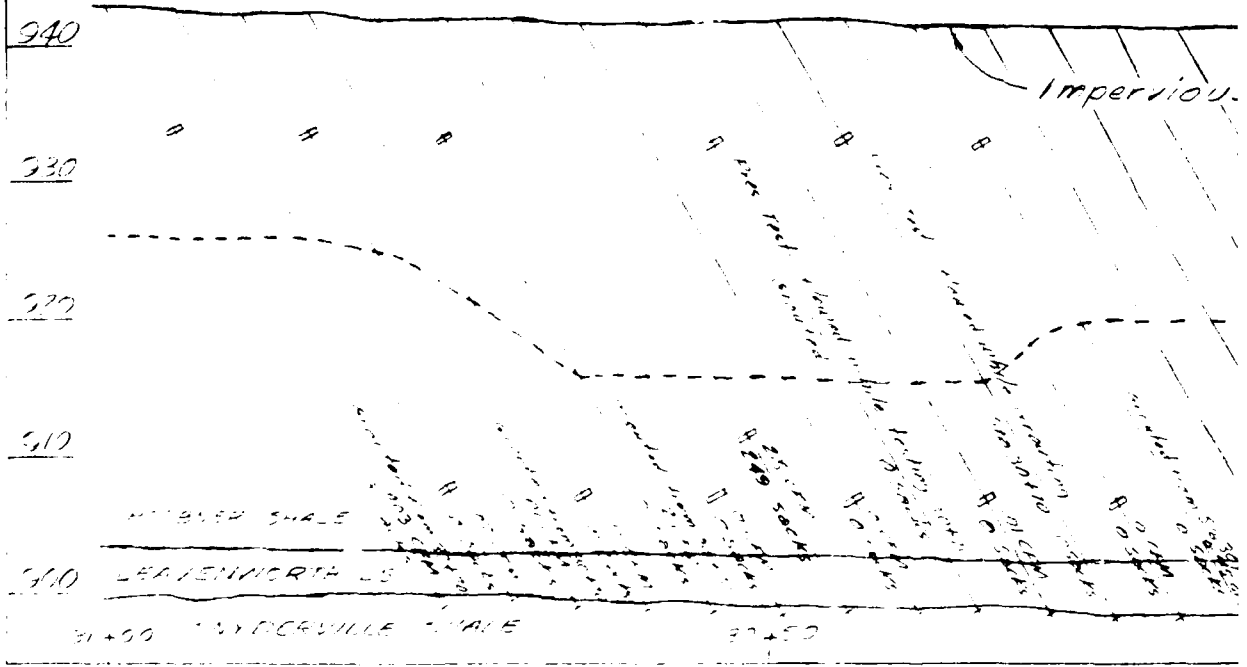
**CORPS OF ENGINEERS U. S. ARMY**  
**KANSAS CITY DISTRICT**

**KANSAS CITY DISTRICT**

**FILE NO. 0-3-995**

**FEBRUARY 1977**

PLATE NO. 37



CURTAIN GROUTING STA 31+00 TO STA 27+50  
SCALE AS SHOWN

AD-A135 578

MULTIPLE-PURPOSE PROJECT OSAGE RIVER BASIN HUNDRED AND  
TEN MILE CREEK KAN. (U) CORPS OF ENGINEERS KANSAS CITY  
MO KANSAS CITY DISTRICT L C MYERS ET AL. OCT 83

22

UNCLASSIFIED

F/G 13/2

NL



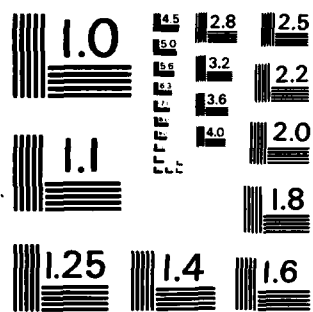
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DATE

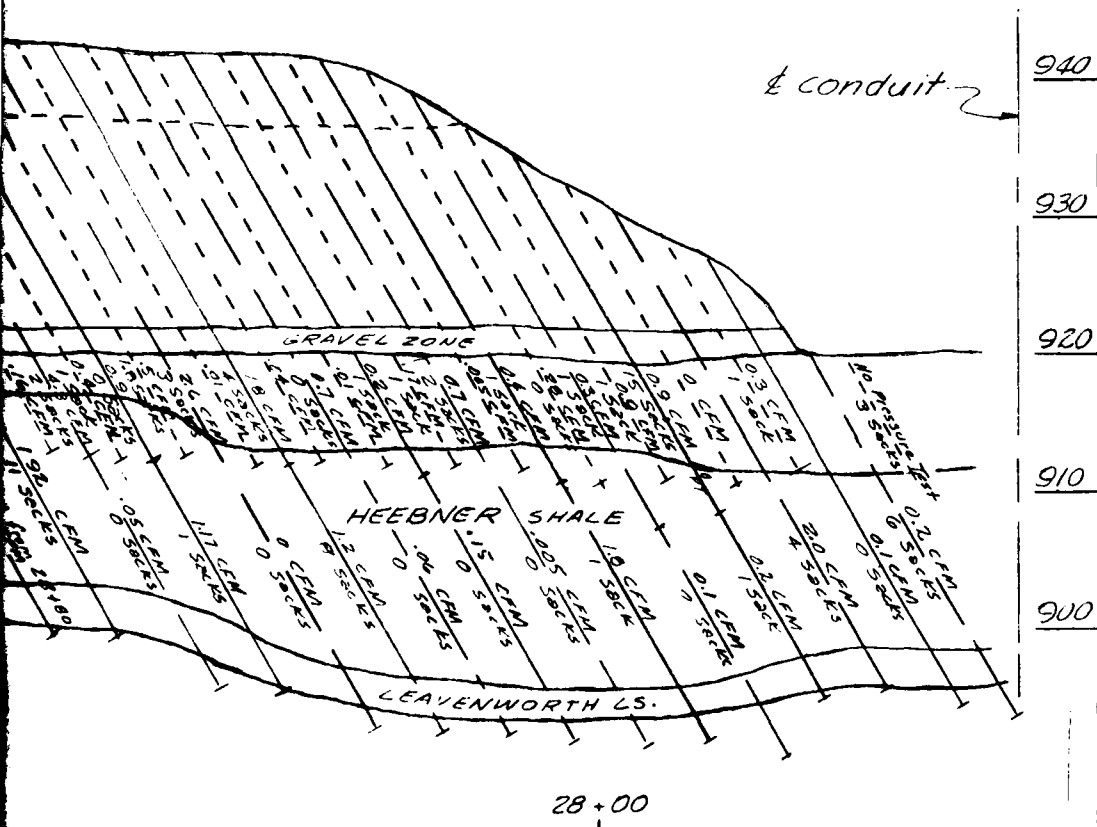
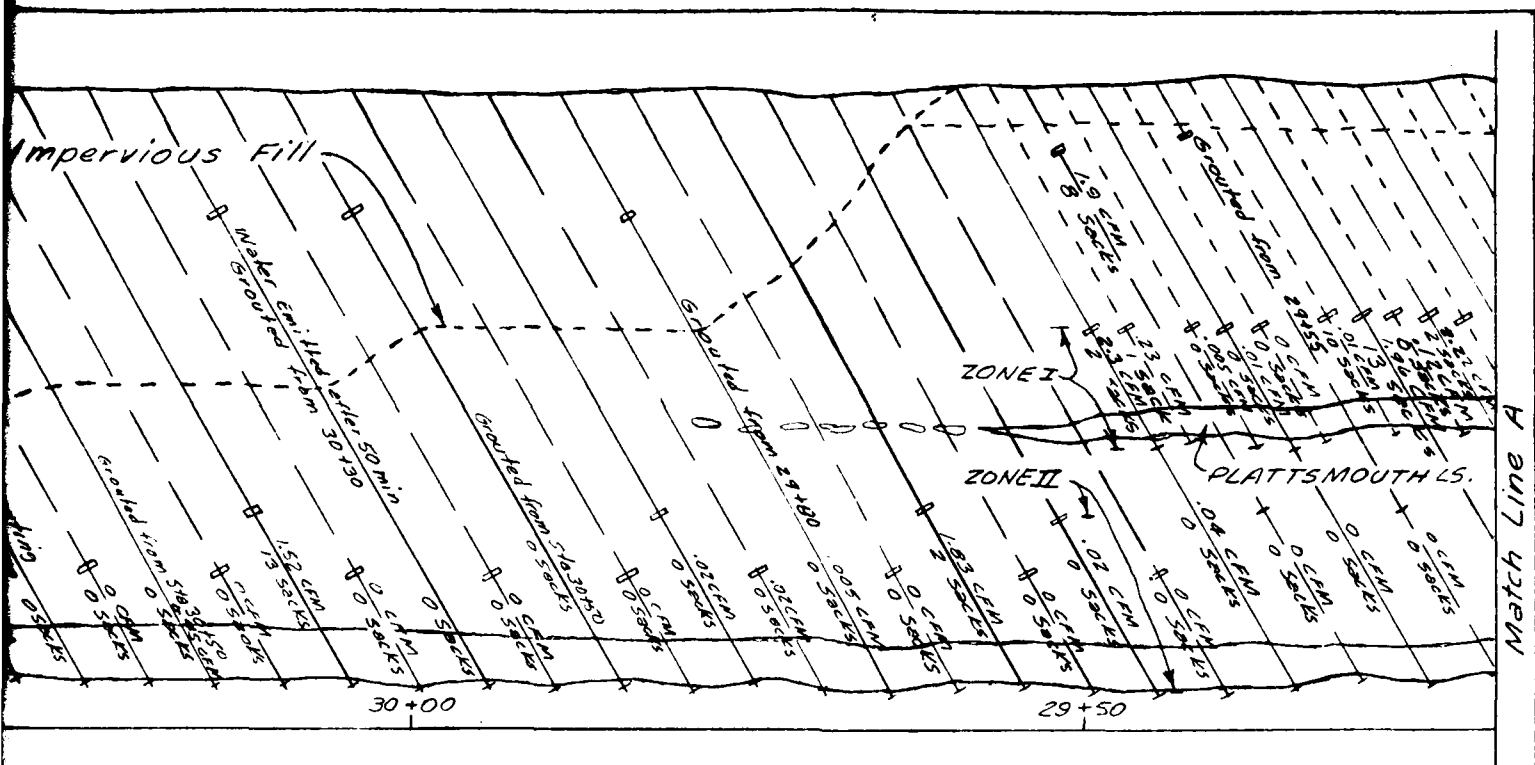
FORMED

1-84

DTIC



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS - 1963 - A



HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA LAKE**

CURTAIN GROUTING  
 STA 31+00 TO STA. 27+90

In 1 sheet

Sheet No. 1

Scale: as shown

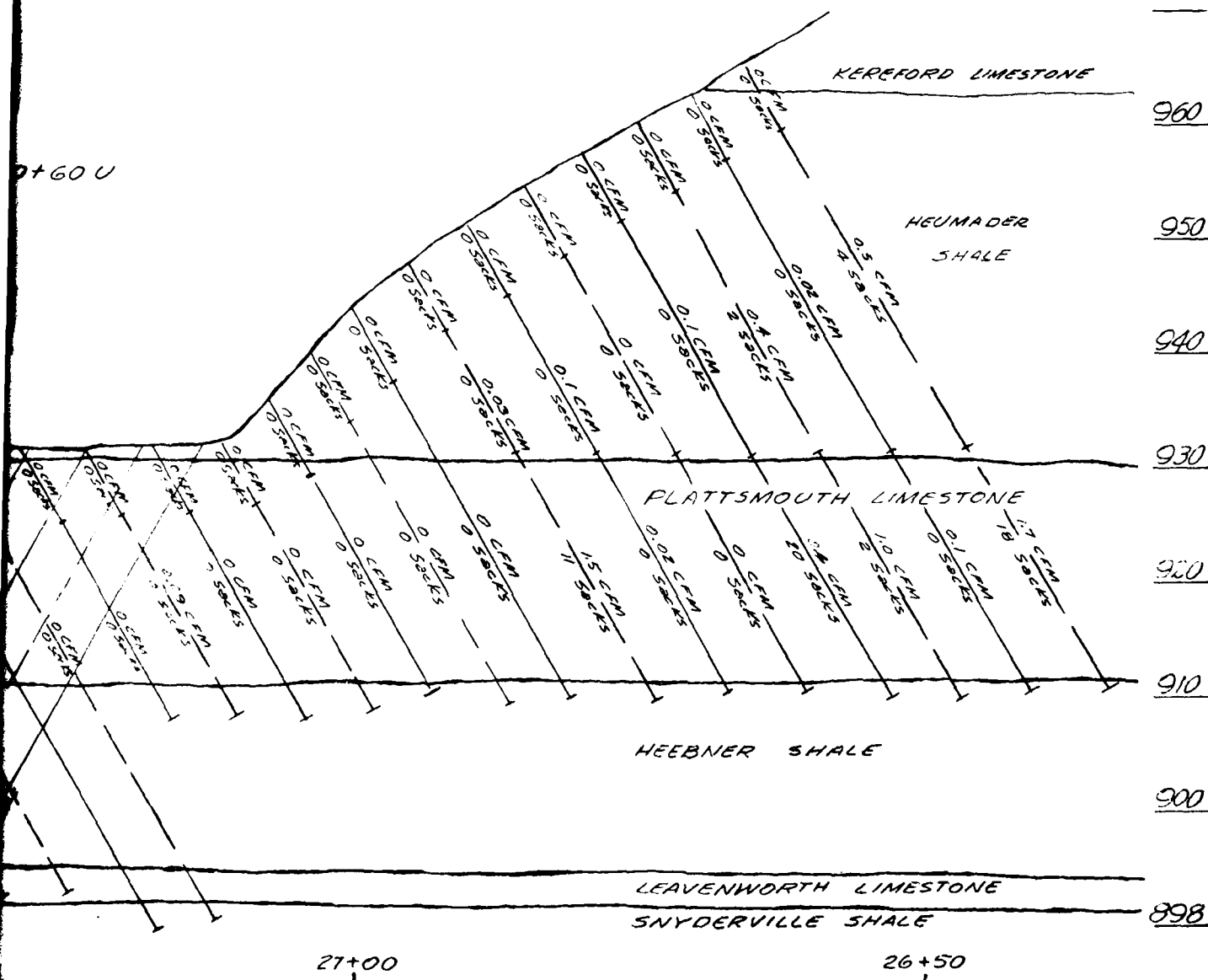
CORPS OF ENGINEERS U. S. ARMY  
 KANSAS CITY DISTRICT

FILE NO. 0-3-996

FEBRUARY 1977

For notes and legend  
 see plate No. 37.





WORKS STA. 28+00 TO STA. 26+50  
AS SHOWN

For notes and legend  
see plate No. 37.

HUNDRED AND TEN MILE CREEK, KANSAS  
**POMONA LAKE**

**CURTAIN GROUTING OUTLET WORKS**  
STA. 28+00 TO STA. 26+50

In 1 sheet

Sheet No. 1

Scale: as shown

CORPS OF ENGINEERS U. S. ARMY  
KANSAS CITY DISTRICT

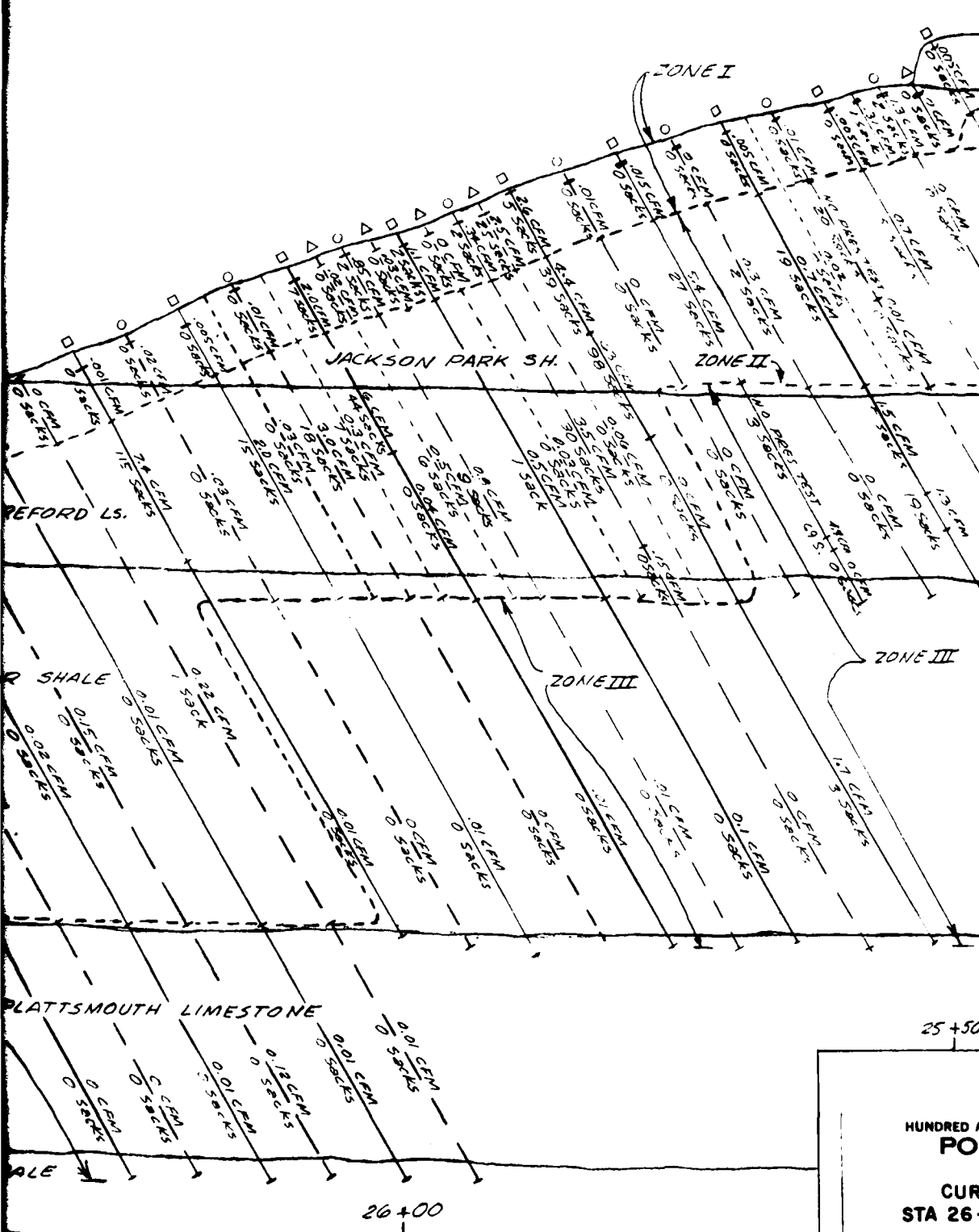
FILE NO. 0-3-997

FEBRUARY 1977

PLATE NO. 39







**HUNDRED AND TEN MILE CREEK, KANSAS**  
**POMONA LAKE**

**CURTAIN GROUTING**  
**STA 26+50 TO STA. 25+50**

In 1 sheet

Sheet No. 1

Scale: as shown

CORPS OF ENGINEERS U. S. ARMY  
 KANSAS CITY DISTRICT

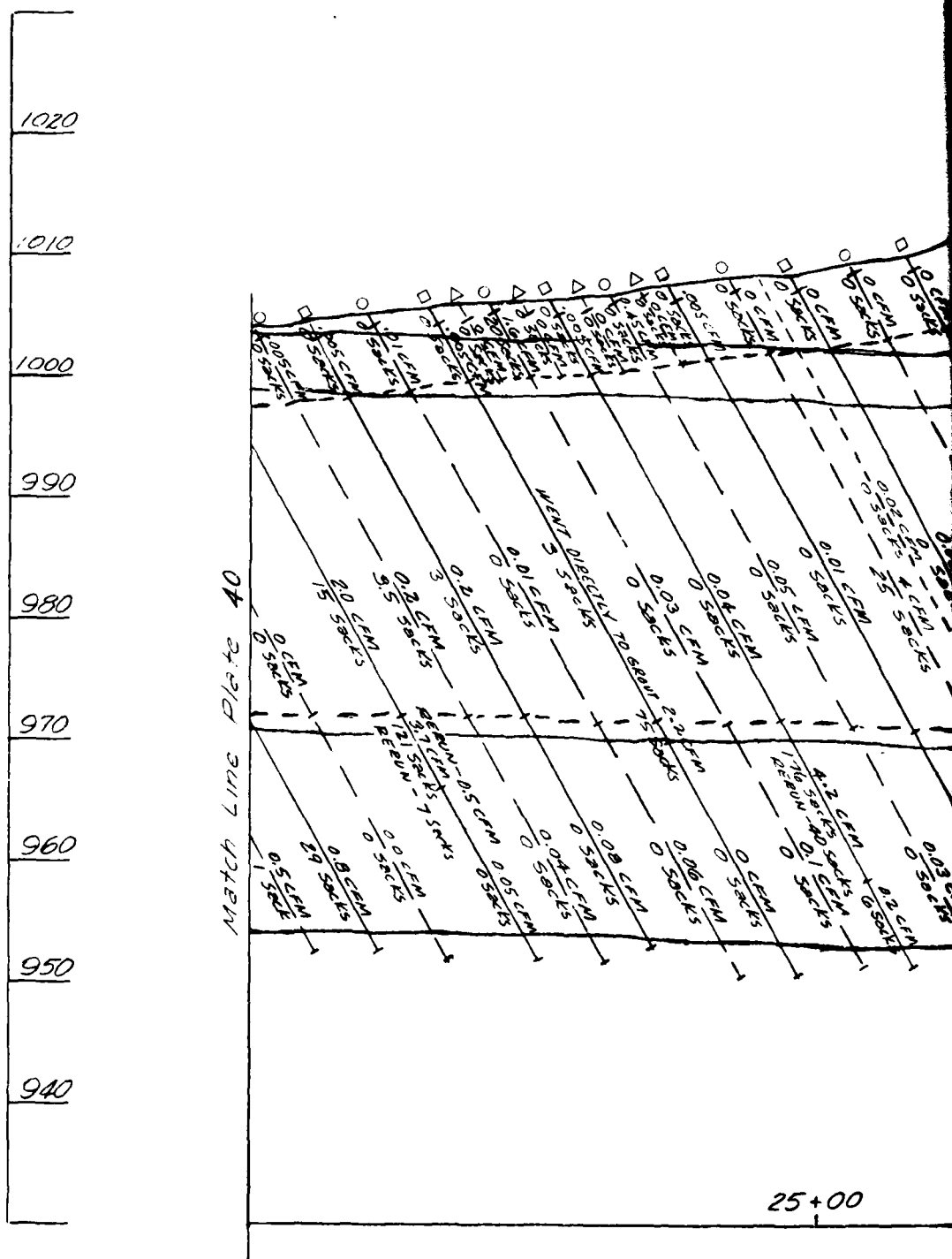
FILE NO. 0-3-998

FEBRUARY 1977

**26+50 TO STA. 25+50**

**AS SHOWN**

*For Legend see Plate No. 37*



CURTAIN GROUTING STA

SCALE AS SHOWN



PHOTOGRAPHS

PHOTOGRAPHS



1. Pomona Lake, Jul 60, Neg. No. R-145-8. Outlet Works. Foundation Preparation, Conduit Monoliths #11 thru 13.



2. Pomona Lake, Jul 60, Neg. No. R-145-10. Outlet Works. Foundation Preparation, Conduit Monoliths #14 thru 16.



3. Pomona Lake, Aug 60, Neg. No. R-147-4. Outlet Works, Foundation Preparation, Conduit Monolith #17.



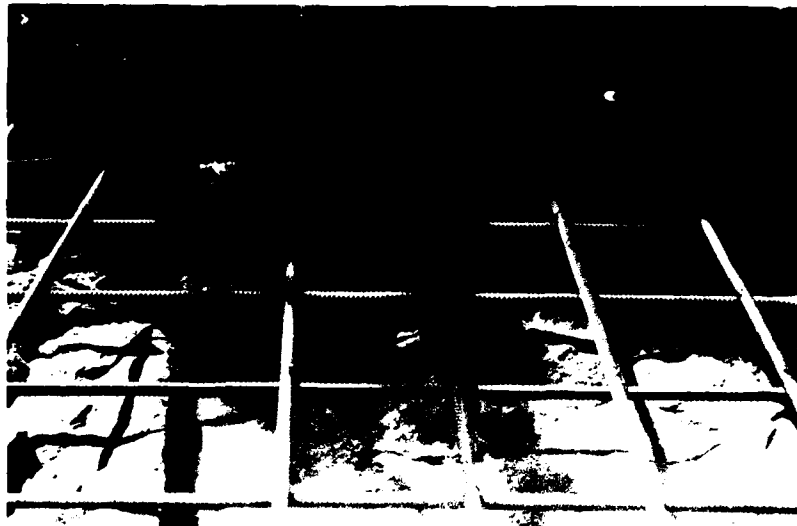
4. Pomona Lake, Aug 60, Neg. No. R-147-13. Outlet Works. Foundation Preparation, Conduit Monoliths #19 to 22.



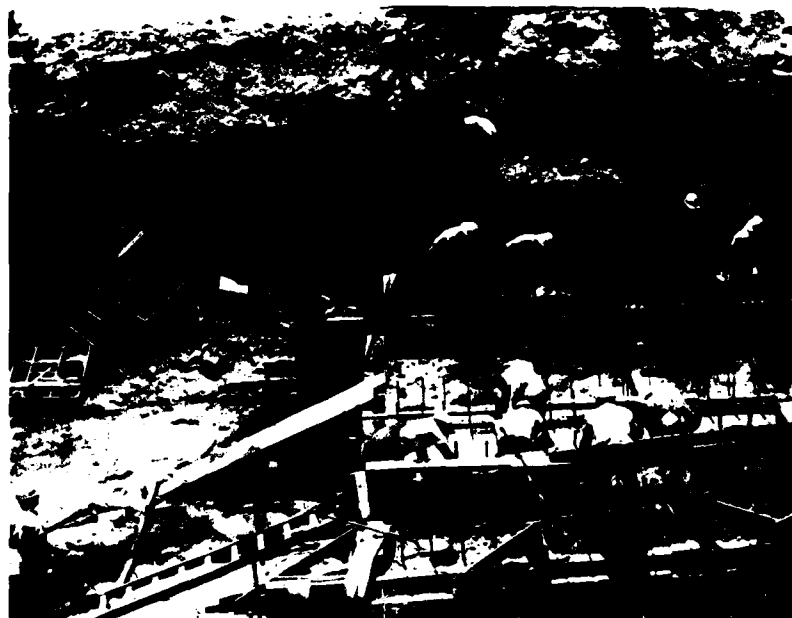
5. Pomona Lake, Aug 60, Neg. No. R-147-7. Outlet Works. Foundation Preparation, Conduit Monolith #22 After Heavy Rain.



6. Pomona Lake, Jun 60, Neg. No. R-142-10. Outlet Works Foundation Preparation, Conduit Monoliths #6 thru 10.

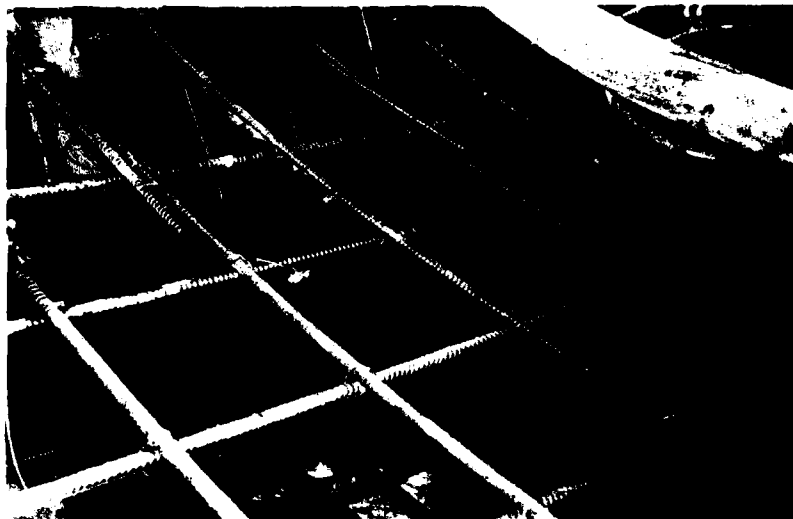


7. Pomona Lake, Jul 60, Neg. No. R-142-15. Outlet Works Foundation Preparation, Tower Monolith #1.



8. Pomona Lake, Jul 60, Neg. No. R-142-16. Outlet Works Foundation Preparation, Conduit Monolith #1.

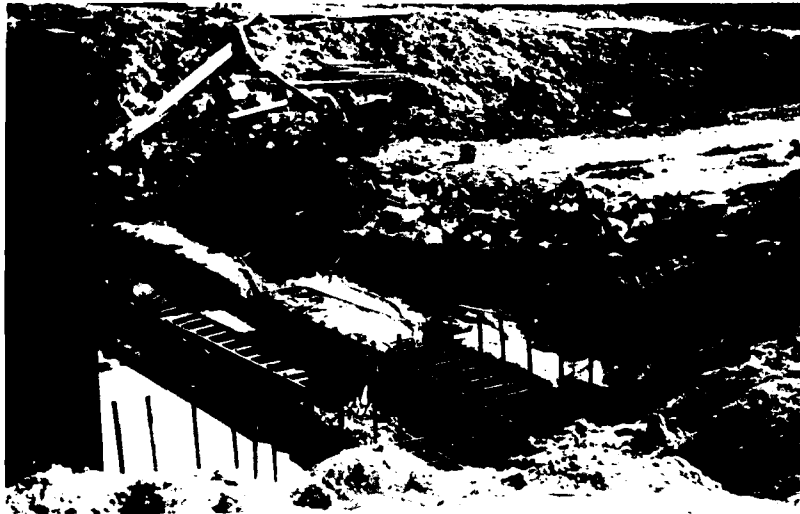




9. Pomona Lake, Sep 60, Neg. No. R-149-6. Outlet Works. Foundation Preparation, Stilling Basin Monolith #2.



10. Pomona Lake, Sep 60, Neg. No. R-149-3. Outlet Works. Foundation Preparation, Stilling Basin Monolith #3.



13. Pomona Lake, Sep 60, Neg. No. R-149-11. Outlet Works. Foundation Preparation, Stilling Basin End Sill.



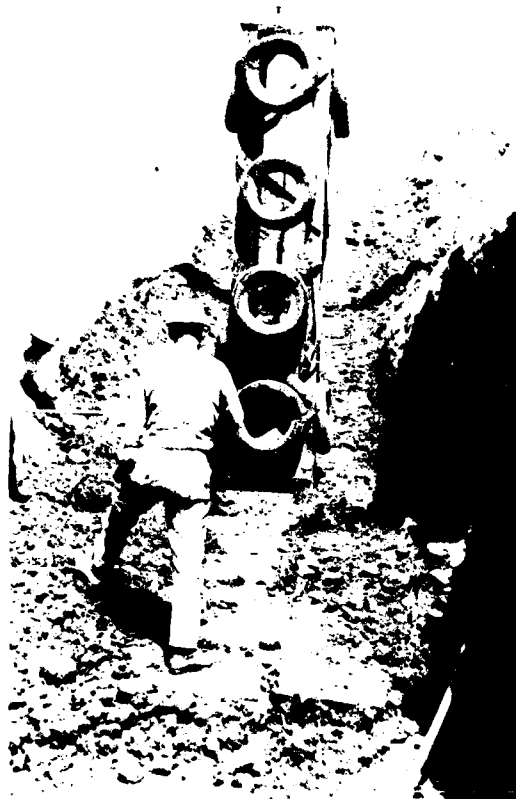
14. Pomona Lake, Sep 60, Neg. No. R-149-12. Outlet Works. Foundation Preparation, Stilling Basin End Sill.



15. Pomona Lake, Neg. No. R-168-12. Special Cleanup Area. Foundation Cleanup Before Placing Impervious Fill.



16. Pomona Lake, Neg. No. R-168-11. Foundation Cleanup. Placing Impervious Fill.



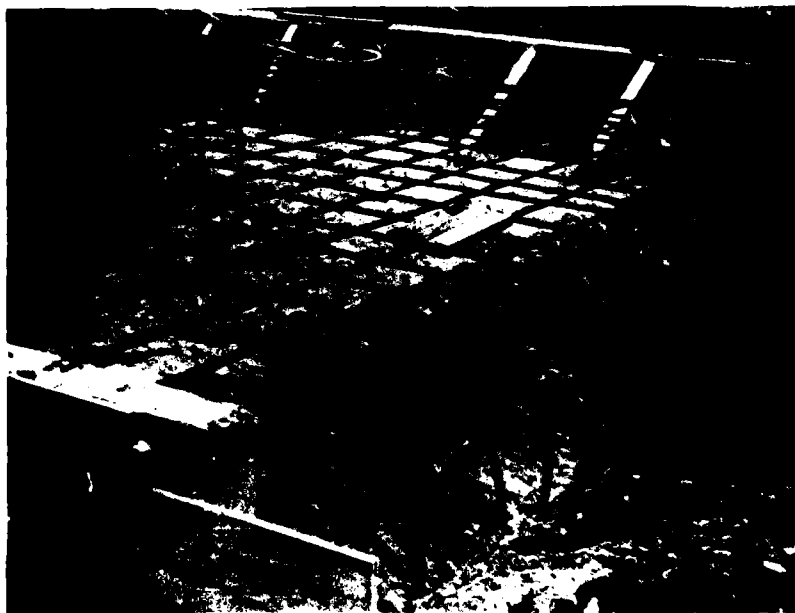
17. Pomona Lake,  
Neg. No. R-168-13.  
Foundation Cleanup  
and Backfill.



18. Pomona Lake, Neg. No. R-168-16. Watering  
Pervious Fill.



19. Pomona Lake, Neg. No. R-151-0. Outlet Works. Rock Excavation in Approach Channel.



20. Pomona Lake, Sep 60, Neg. No. R-151-6. Spillway Sill. Foundation Preparation Monolith #4.



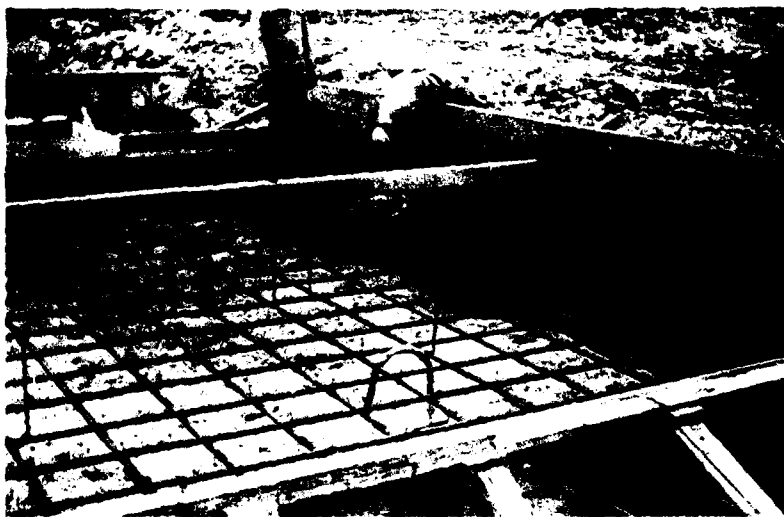
21. Pomona Lake, Sep 60, Neg. No. R-149-21. Spillway Sill.  
Foundation Preparation Monolith #3 thru 5.



22. Pomona Lake, Sep 60, Neg. No. R-149-20. Spillway  
Sill. Foundation Preparation Monoliths #6 & 7.



23. Pomona Lake, Sep 60, Neg. No. R-151-8. Spillway Sill. Foundation Preparation Monolith #7.



24. Pomona Lake, Sep 60, Neg. No. R-151-9. Spillway Sill. Foundation Preparation Monolith #8.

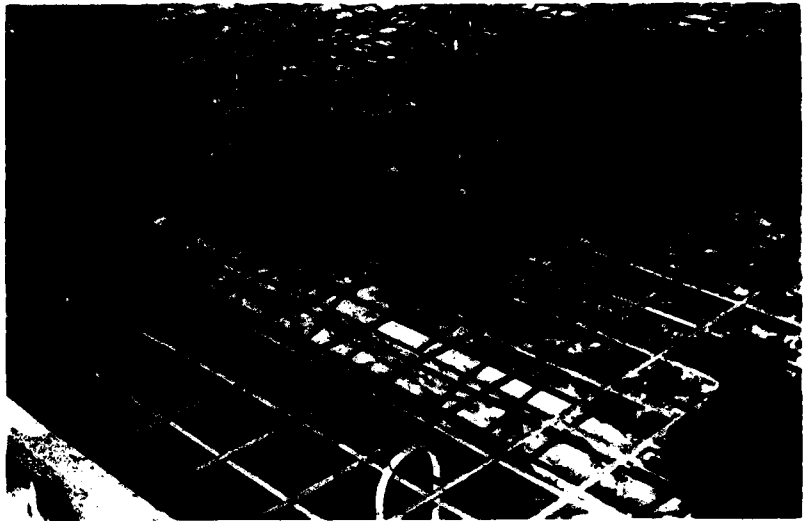


25. Pomona Lake, Sep 60, Neg. No. R-151-14. Spillway Sill. Foundation Preparation Monolith #9.



26. Pomona Lake, Sep 60, Neg. No. R-149-19. Spillway Sill. Foundation Preparation Monolith #20.





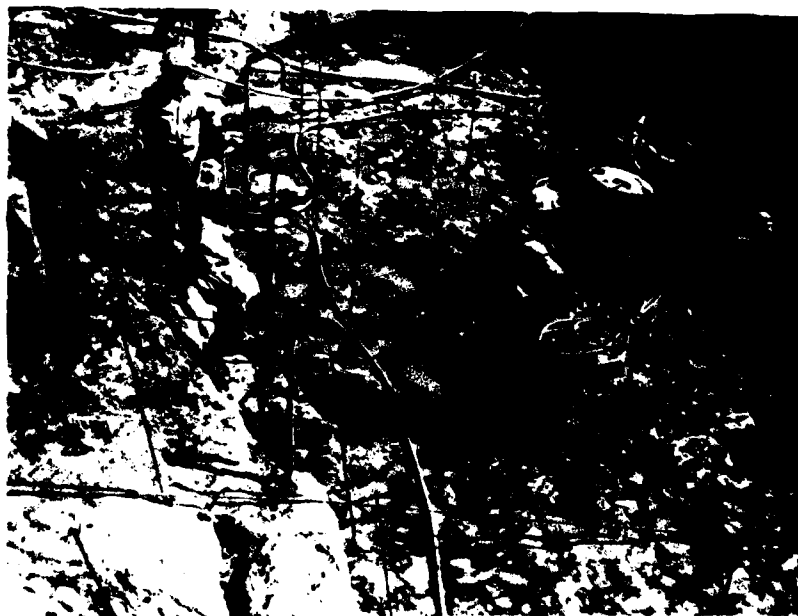
27. Pomona Lake, Sep 60, Neg. No. R-149-18. Spillway  
Sill. Foundation Preparation Monolith #21.



28. Pomona Lake, Sep 60, Neg. No. R-149-13. Spillway  
Sill. Foundation Preparation Monolith #23.



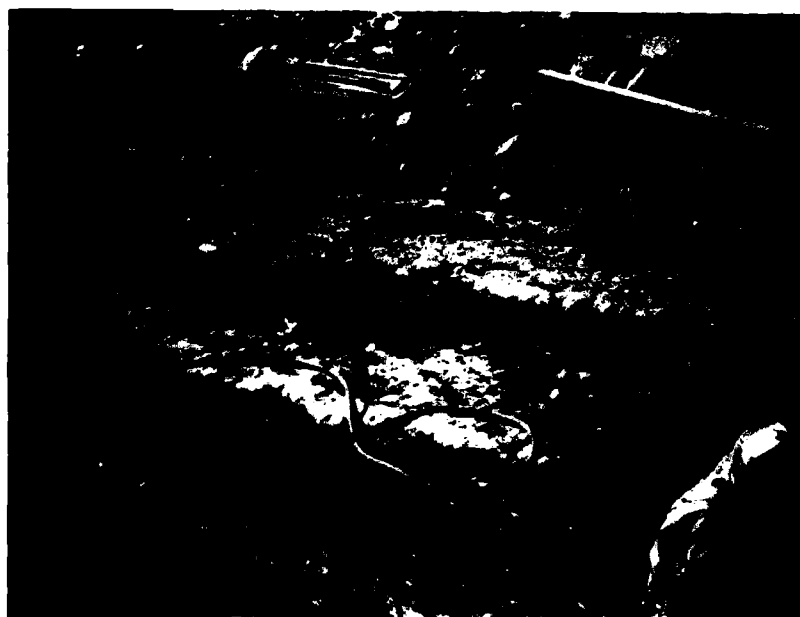
29. Pomona Lake, Sep 60, Neg. No. R-148-8. Spillway Sill. Foundation Preparation. Drilling Holes for Anchor Bars.



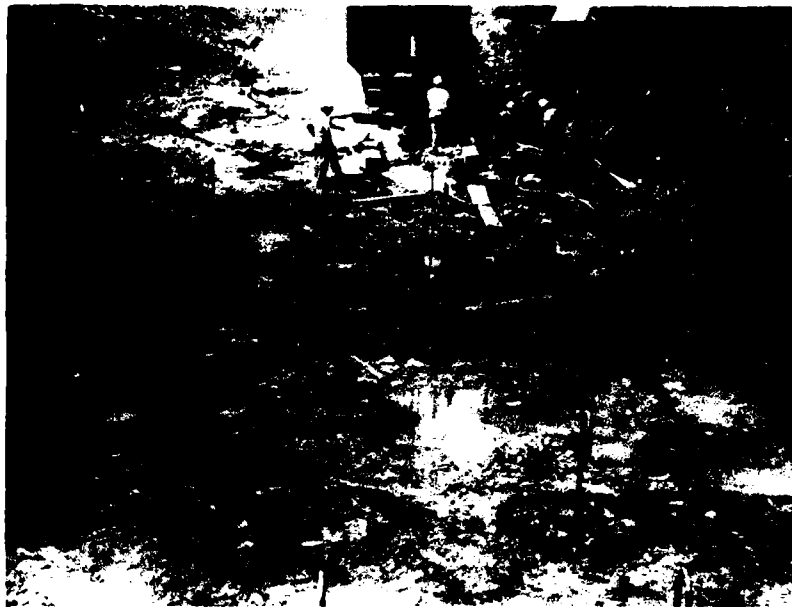
30. Pomona Lake, Sep 60, Neg. No. R-149-2. Spillway Sill. Foundation Preparation. Anchor Bars Installed. Left Slope.



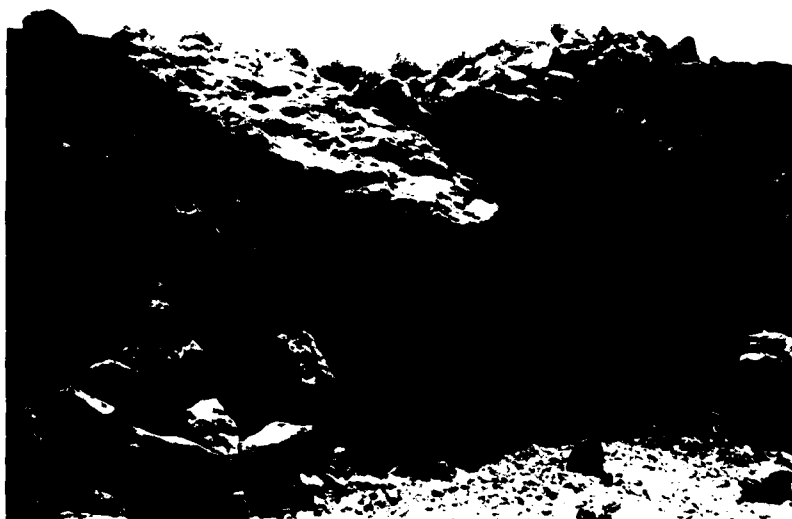
31. Pomona Lake, Aug 60, Neg. No. R-171-6. Left Abutment Grout Trench. Foundation Cleanup.



32. Pomona Lake, Aug 60, Neg. No. R-147-2. Outlet Works. Stilling Basin Anchor Bars.



33. Pomona Lake, Aug 60, Neg. No. R-147-16. Outlet Works. Stilling Basin Anchor Bars.



34. Pomona Lake, Nov 61, Neg. No. R-168-17. Placing Class II Rockfill Sta. 46+00.



35. Pomona Lake, Nov 61, Neg. No. R-160-15. Riprap Type B, Test Load.



36. Pomona Lake, Nov 61, Neg. No. R-160-3. Riprap Type B, Stage I.



37. Pomona Lake, May 60, Neg. No. R-145-5. Grouting on Right Abutment.